Public Safety Radio Strategic Planning Committee

2007 Statewide Integrated Public Safety Communications Strategic Plan

A plan for California State public safety communications system integration, modernization and interoperability

Report to the California State Legislature

as required by Government Code §8592.6

January 2007

Public Safety Radio

Strategic Planning Committee:

2007 Statewide Integrated Public Safety Communications Strategic Plan

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A plan for California State public safety communications system integration, modernization, and interoperability

REPORT TO THE CALIFORNIA STATE LEGISLATURE
as required by Government Code § 8592.6

January 1, 2007

Governor
Arnold Schwarzenegger

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March 30, 2007

To: Members of the California State Legislature

It is my honor to transmit this report on behalf of the Public Safety Radio Strategic Planning Committee (PSRSPC) membership. The 14 state agencies involved with PSRSPC activities in 2006 have accomplished an exceptional amount of work in pursuit of the diverse and complex communications challenges facing California. The level of commitment of all associated with this effort is outstanding, and I am honored to serve as chair of this dedicated group of departments and individuals.

This report serves several key purposes well beyond the statutory requirement. It reflects the current status of state agencies' systems and challenges; outlines a robust vision for interoperability in California; identifies key integration steps and partnerships with local government; documents two year critical operability needs for state agencies as a first step; and establishes a clear work plan for 2007 to continue the collaborative efforts underway to accomplish the goals. This plan is a clear road map that identifies both the strategic approach and the practical actions needed to accomplish integrated interoperable communication in California.

It is important to stress the high degree of local partnership involved with the development of this report. Throughout this year's efforts, representatives from the California Statewide Interoperability Executive Committee (CALSIEC) participated in PSRSPC's executive meetings and were consulted throughout the development of the strategies and action steps contained in this document. Additionally, a 'Beta Test' meeting of the draft report was held jointly between CALSIEC and PSRSPC on November 21, 2006, where local, state, tribal, and private organizations participated in a review of the report and its findings. Many changes were incorporated as a result of this collaborative approach.

This report is a result of these advanced coordination activities between all interested organizations around the state. Although this is the PSRSPC's annual report to the Legislature, it is - in effect - a snapshot of the integrated needs, activities, ongoing challenges, and recommendations of California's diverse intergovernmental communications community. You may access an electronic copy of the report at www.oes.ca.gov.

On behalf of the PSRSPC membership, I look forward to hearing from legislative members early in 2007 so that we may move forward together to ensure that a robust and sustained communications future is established for California.

Sincerely,

HENRY R. RENTERIA
Director

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Note: A companion document to this report, "Compendium of References" (Appendices), can be found on the PSRSPC Website. (http://rimsinland.oes.ca.gov/CTD/Public/psrspcweb.nsf/home?OpenForm)

Approving Departments

The Directors or their designees of the following agencies are members of the Public Safety Radio Strategic Planning Committee and have been involved in preparation of this report and strategic plan.

- Governor's Office of Emergency Services (OES) *(Statutory chair effective January 1, 2007)*
- California Highway Patrol (CHP)
- Department of Transportation (CalTrans)
- Department of Corrections and Rehabilitation (CDCR)
- Department of Parks and Recreation (DPR)
- Department of Fish and Game (DFG)
- Department of Forestry and Fire Protection (CDF)
- Department of Justice (DOJ)
- Department of Water Resources (DWR)
- Department of Health Services (CDHS) *(Statutory member effective January 1, 2007)*
- Emergency Medical Services Authority (EMSA)
- Department of General Services (DGS)
- Governor's Office of Homeland Security (OHS)
- Military Department *(Statutory member effective January 1, 2007)*

Executive Summary

California continues to stand ready to respond to all emergencies, and radio communication is a cornerstone of this capability. This report provides the Legislature with the information necessary to take positive steps toward improving California's public safety communications foundation and infrastructure. It addresses critical issues, mandates, projects, goals, and progress in 2006—and outlines an aggressive work plan for 2007 and beyond. The PSRSPC believes that through effective leadership and partnership with the Legislature and the Executive Branch, California's interoperability communications can be greatly improved and ultimately positioned to become a national success story. Clear guidance and financial support, however, are greatly needed and will help to advance communications standardization and modernization throughout the state.

Accomplishments

2006 was an extremely productive and busy year for the PSRSPC agencies, as the strategic plan developed in late 2005 was implemented and additional projects were undertaken. Concrete implementation steps were designed as the result of a significant effort undertaken by the members to gather data and determine critical needs.

➢ Statewide Needs Analysis and Assessing System Capabilities Survey

The first and possibly most critical achievement was the completion of a Statewide Needs Analysis and Assessing System Capabilities Survey. The survey has given the PSRSPC the data needed to move forward in building the California Statewide Communications Interoperability Plan (CALSCIP). Over 240 state and local agencies participated, making it one of the most comprehensive communications systems assessments the state has ever performed.

The data gained from the survey is not only important in creating the CALSCIP and a long-term "System of Systems" for public safety communications, but also in creating a short-term solution for interoperability statewide. With the information received, OES Geographic Information Systems Analysts were able to map existing operable gateway radio units across California. This gave PSRSPC the framework with which to begin building a statewide gateway network that will serve as an immediate, cost-effective short-term solution to localized, incident-based interoperability.

➢ PSRSPC and CALSIEC Collaboration

Never before has there been so much coordination of work effort between PSRSPC and the California Statewide Interoperability Executive Committee (CALSIEC), which is comprised of local, state, federal, and tribal government representatives. The CALSIEC played a tremendous role in the success of the survey. Through each of the four CALSIEC planning areas, CALSIEC members helped to gather information about local communications systems so that the PSRSPC could begin to create a framework of resources across the state.

➢ The Gateway Project

Because of strong interagency coordination between the 11 PSRSPC members, OES was able to secure 2006 Homeland Security Grant Program funding on behalf of the PSRSPC to buy six mobile gateway units that will be deployed to each of California's mutual aid regions. OES will procure and deploy the mobile gateway units by the end of 2007. These new gateways will be able to be mission tasked by OES and at least one of the six gateways will be deployable to an incident anywhere in the state within two to three hours. The procurement of these gateways will mark an important first step in building an interoperable public safety communications system.

Challenges

➢ The Population and Geography of California

Despite this success, there are challenges that the state will have to address before achieving true interoperability. Many states across the country are in the same position as California—these states are trying to build a comprehensive interoperable public safety communications system. However, not one of them faces the population and geography issues that California does. California has over 43,000 state-employed public safety officials, almost all of whom use some type of radio communications device on a daily basis. In addition to being the most populous state in the union, California is also one of the most geographically diverse. This presents numerous operational problems as public safety agencies use varying radio frequencies based on the local topography.

True interoperability is achievable in California, but it will take the continued dedication of the PSRSPC member agencies and a sustained funding source to support the creation of an innovative interoperable communications system that is customized for California's needs.

➢ Operability

As a first step towards interoperability, the PSRSPC has identified an initial estimate of state agency funding needs to meet critical operability requirements over the next two years. The need for this investment is supported by the aforementioned System Capabilities Survey, which showed obsolescence rates of 47 to 81 percent for seven categories of state agency radio equipment. These systems are beyond their life expectancies and many are no longer supported by the manufacturers. The PSRSPC agencies have collectively determined the equipment that is essential to keeping the state's public safety radio system operable. The initial estimate for defined critical operability equipment over a two-year period for PSRSPC agencies is $85 million.

➢ Governance

Operability is the first of two necessary steps in creating interoperability; the second is governance. As defined by the U.S. Department of Homeland Security's SAFECOM program, governance refers to establishing a shared vision and an effective organizational structure to support any project or initiative through common policies, processes, and procedures. PSRSPC is working to create state and regional level memoranda of understanding/interoperable communications plans to be assimilated, evaluated, and defined within the larger scope of California's evolving Statewide Communications Interoperability Plan (CALSCIP). California's immense, yet diverse public safety community has made it difficult to foster agreements between parties regarding how the interoperable system should function. The PSRSPC will continue to work through these

governance issues, using a combination of proven best practices from across the country and examples from mutual aid programs that California has successfully employed in the past. While the PSRSPC is committed to supporting the aggressive goals and objectives outlined in this report, it should be noted that the estimated annual workload among the PSRSPC agencies totals 20 personnel years for each of the next two fiscal years.

➢ Funding

Funding is needed to support both the critical operability and governance projects. PSRSPC emphasizes that radio system operability must be solved either before, or in conjunction with, any movement towards accommodating interoperability. Investment is needed to develop a new approach to improving state owned/operated public safety radio and wireless components, as well as the ongoing modernization of local systems, to ensure that future radio systems serving California achieve robust interoperability. To do this will require a sustained funding source. We cannot discount the importance of federal funding, which has carried this project to where it is today. Unfortunately, federal funding is not consistent or guaranteed. It is understood that grant funding benefits the state's short-term limited purchases, but it also presents a dilemma to state agencies. Grants are ineffective in supporting large-scale, capital intensive projects because of their short funding cycles and specific eligibility criteria. Sustained and clearly defined funding would allow both state and local governments to link system development projects and prioritize key modernization efforts in concert with the 'system of systems' design now in place.

2007 Action Plan

In response to many of the challenges PSRSPC is currently facing, this report proposes an action plan that outlines the committee's goals and objectives for 2007 and a timeline for interoperability in California over the next ten years.

➢ Statewide Communications Interoperability Plan

The primary objective for 2007 is to create the CALSCIP – the plan for statewide interoperable communications and chief governance document. To accommodate local requirements and ensure congruity throughout California, the PSRSPC is working in collaboration with CALSIEC to develop this plan. The planning process will be driven from the local level and will focus on building support for the plan at every level of government.

➢ CALSIEC

PSRSPC is recommending that CALSIEC be formally recognized in law or by Executive Order for its role in the administration of interoperability channels and the establishment of technical and operational policies for interoperability channels. The PSRSPC will collaborate with CALSIEC in defining these roles in 2007.

➢ Funding

The Statewide Needs Survey has shown that finding funding for critical operability and then a statewide interoperable "system of systems" must be a priority. Equipment lacking operability inhibits the progress of interoperability. In addition, operable equipment is critical to the day to day operations of the state agencies. The first phase in California's effort to achieve interoperability will be to identify funding to address the problem of operability. The second phase will include an

identification of long-term sustained funding that will help California reach its end goal of building a "System of Systems" that will create statewide interoperability. This report outlines PSRSPC's recommendations for possible sources of long-term secured funding for interoperability. These recommendations were approved by the committee after the presentation of research that was collected from numerous other states that have instituted long-term funding programs to build interoperable communications systems. Now that the state agencies' funding needs have been identified, the PSRSPC will work to create a collaborative budget package that will be sent to the Governor's Emergency Operations Executive Council for approval and recommendation to the Governor.

Spectrum

By 2009, PSRSPC hopes to implement California's portion of the 700 MHz spectrum to public safety use. Forward planning for the implementation of the state's portion of this key resource is imperative if the state is to meet the aggressive implementation conditions that the Federal Communications Commission imposes on use of the 700 MHz spectrum.

Conclusion

California has developed and maintained an integrated multi-discipline, multi-agency emergency management system that is emulated by the nation. In order for this system to succeed, the state's public safety responders—local, state, tribal, and federal—must be able to communicate with each other using an interoperable communications system. The system components are more than pieces of equipment. To be successful, the system must be supported by an organizational structure, standard operating procedures, and training and exercises. And, as with any successful business venture, the system must have reliable funding to remain viable. The PSRSPC stands strongly committed to working with the Legislature and in partnership with local agencies through CALSIEC to address the policy and program challenges that remain on the path towards complete interoperability for California.

Chapter 1 - Where We Are Today

Background

California's public safety and public service agencies provide a wide range of support including law enforcement, fire protection, disaster response, transportation management, flood control, criminal detention and rehabilitation, search and rescue, and other services to over 36 million residents and 44 million visitors to the state each year. In order to effectively and responsively provide these services, the state's public safety agencies must be able to communicate effectively for routine and emergency operations. During disasters, such as California's frequent wildfires and floods and potential catastrophic earthquakes or a terrorist events, the interoperability of communications systems becomes especially critical since multiple agencies and organizations are involved in emergency responses.

The Public Safety Radio Strategic Planning Committee (PSRSPC) was initially convened by the Department of General Services in the 1990s. Currently chaired by the Governor's Office of Emergency Services, the PSRSPC was established by statute (effective January 1, 2003) to address the need for an integrated public safety communications system that facilitates interoperability among the state's public safety departments, in consultation with other federal, state, and local entities. In its 2006 report to the Legislature, the PSRSPC outlined goals and objectives to move the state towards an interoperable communications system. Critical issues to be addressed in 2006 included an assessment of the state's existing communications equipment and systems; identification of high-priority needs for "gateway" bridging technology to increase interoperability in the near term; initiating development of California's requirements for the next generation state communications network; and addressing stop-gap and sustained funding for public safety communications infrastructure and governance.

Extensive coordination among the PSRSPC member agencies and outreach to stakeholder groups are necessary to meet these goals. The staff-level PSRSPC-Technical Working Group (TWG), established in 2005 to develop recommendations and carry out essential activities for the PSRSPC, met regularly throughout the year. The PSRSPC-TWG used work teams to develop California's vision for public safety communications and to address the state's assessment and needs analysis; system development; spectrum management; governance; gateway bridging technology; fiscal issues; collaboration between the PSRSPC and its primary affiliate - the California Statewide Interoperability Executive Committee (CALSIEC); and development of this annual report. The executive level PSRSPC met quarterly to consider recommendations developed by the PSRSPC-TWG and to provide guidance on its activities.

The Legislature has recognized that, while the initial focus of the PSRSPC's work was on state agencies, effective development and application of an interoperable communications network must reflect the day-to-day organizational structure and protocols of California's public safety agencies. Governor Schwarzenegger signed into law legislation that expands the duties of the PSRSPC and ensures that coordination with local, regional, and federal entities will occur. As a foundational step to align strategic goals, the PSRSPC's 2007 report to the Legislature was validated by CALSIEC, whose members represent federal, state, regional, local, tribal, and non-governmental entities (For purposes of this document, references to coordination and collaboration with

CALSIEC denote working with all categories of CALSIEC membership, as well as the committee itself). These joint meetings and collaborative activities allowed for a more complete statewide viewpoint for the annual report.

Needs Analysis & Assessing System Capabilities Survey

In last year's annual report, the commitment was made to assess the equipment and procedural systems that are currently being used at the state and local levels. The PSRSPC has long noted that, in much of California, a lack of effective and reliable radio communications is impeding the state's public safety agencies' abilities to perform their most elemental mission: the protection of life and property[1]. In 2006, CALSIEC and the PSRSPC collaborated on a statewide Internet-based survey to address radio systems at all levels of government and to analyze their interoperability (see Compendium of References, Appendix 1). Eleven of the current PSRSPC state agency members that operate radio systems were required to complete the survey and local agencies were encouraged to participate.

The survey covered radio systems; system radio frequencies; radio facilities and equipment; survivable communications systems, i.e., cache or reserves; audio gateway systems; dispatch operations; advanced capabilities, e.g. microwave or satellite systems; current needs and requirements of radio systems; future system directions and initiatives; and interoperability progress in governance, standard operating procedures, technology, training and exercises, and usage.

Respondents to the survey include 13 state agencies and, currently, over 230 local agencies (city, county, regional, joint powers authorities, colleges, etc.). Validation of the survey data gathered is in process to correct duplicate entries and clarify ambiguous responses.

The survey data indicates the following state system information/capabilities:

- Frequency bands used by state agencies range from 2MHz to 800MHz.
- State agencies have over 19,000 mobile radios.
- State agencies have over 26,000 portable radios.
- State agencies have over 1,800 base station radios.
- State agencies have over 1,000 mobile relay radios.
- State agencies have over 800 control station radios.
- State agencies have 19 mobile gateways and 25 fixed gateways.
- State agencies have over 5,000 portable radios as cache/reserve.
- State agencies have over 2,000 cellular phones as cache/reserve.
- State agencies have over 80 portable mobile relays as cache/reserve.
- State agencies have listed, in priority order, the current top three needs and requirements of the radio systems as funding, modernization, and additional channels.

The survey data indicates the following local agency information/capabilities:

- Frequency bands used by local agencies range from 2 MHz to 800 MHz.
- Local agencies in 17 counties report having either mobile or fixed gateways.

[1] See State of California Partnering for the Future: Cost Benefit Analysis for California's Public Safety Radio Communications Project published 1999

- Nearly 100 local agencies report being part of a tactical interoperable communications plan (TICP).
- Local agencies have listed, in priority order, the current top three needs and requirements of the radios systems as funding, additional channels, and modernization.

Emerging Trends and Themes

Several trends emerged from the statewide survey and work accomplished by the PSRSPC in 2006. These findings were used to identify the priority initiatives for 2007 and beyond discussed in Chapters 2 and 3.

➢ Obsolescence

The most prominent trend is that a significant percentage of the state's radio system equipment is not sufficiently operable, functional, sustainable, flexible, or interoperable[2]. To measure the portion of state agencies' radio systems that cannot be considered operable, state agencies were asked how much of their equipment meets one or more of the following conditions for obsolescence:

- The radio equipment is older than the useful life expectancy for radio system equipment as determined by the Department of General Services, Telecommunications Division
- The radio equipment is no longer supported by the radio equipment manufacturer or repair parts are no longer available
- The radio equipment does not meet current FCC technical requirements

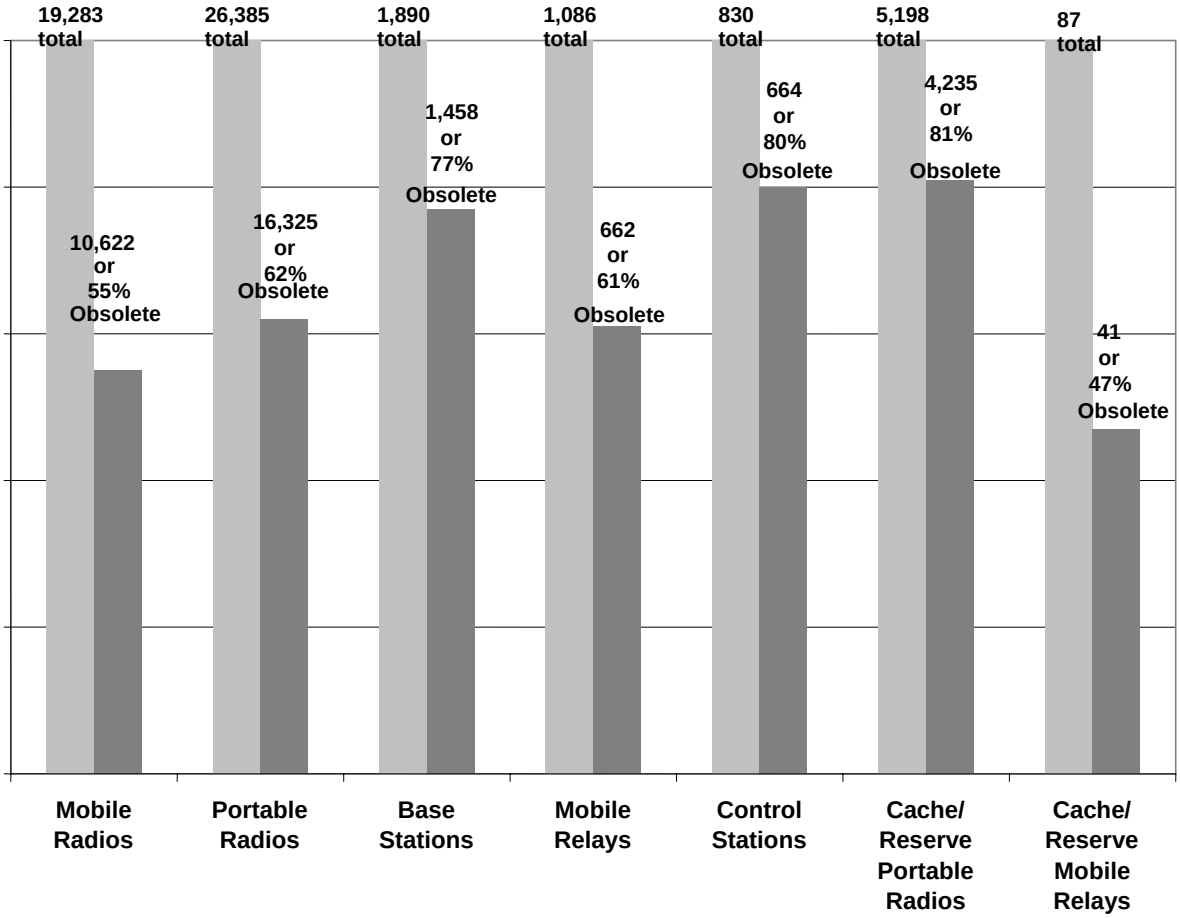
Figure 1 (page 9) depicts the percentage of state agency radio equipment considered obsolete. The survey findings provide strong evidence that as a part of any state agency's move towards interoperability, the problem of operability must first be solved.

The daily problems regarding operability can be easily seen in the paraphrased description of an ongoing problem in one of the PSRSPC agencies: *"We have in our field divisions a unique situation where our inside facility operators talk on an old Moducom Console that is hard wired to a telex audio bridge to our VHF and UHF base station radios . The VHF is used for outside the facility and the UHF is used for inside the facility. The operators are required to stay in contact with staff both inside and outside the facility for day-to-day and safety communications. Staff must drive to locations away from the facility to inspect other facilities and take readings and verify measurements. These facilities are many stories under ground and gases accumulate in the lower levels creating a hazard. Staff are required to carry radios to these locations. The radios they use are not intrinsically safe, are old, and cannot be repaired (no available parts). On Tuesday, I received an email asking for replacement of mobile radios. Recently a new fleet of vehicles was purchased and the mobile radios are to be removed from the old vehicles and placed in the new vehicles. It was discovered by DGS-TD Technicians that the mobile radios are failing and parts are not available. This scenario is occurring in every field division of the Department almost daily. Old equipment, where feasible, is being scavenged to repair other like equipment, only to fail again and finally be discarded due to total failure."*

[2] For the purposes of this report, operability, functionality, sustainability, and flexibility are consolidated under the term "operability."

Most of the PSRSPC agencies have very similar operability issues because equipment is old, there is a lack of repair parts and manufacturer support, or because the equipment falls short of FCC technical requirements.

➢ Figure 1 - Percentage of State Agency Radio Equipment Considered Obsolete



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Percentage of State Agency Radio Equipment Considered Obsolete

- Older than useful life expectancy for radio system equipment per DGS-TD
- No longer supported by equipment manufacturer or repair parts no longer available
- Does not meet current FCC technical requirements

➢ Funding

The next trend is that both state and local agencies have listed funding and additional channels as the foremost and most challenging requirements standing between them and radio system modernization. Again, the PSRSPC emphasizes that radio system *operability* must be solved either before, or in conjunction with, any movement towards accommodating interoperability. Investment in developing a new approach to improve state owned/operated public safety radio and

wireless components, as well as the ongoing modernization of local systems, are needed to ensure that future radio systems serving California achieve robust interoperability.

➢ Spectrum

The survey results also underscore the need for more radio frequencies. This is a serious problem nationwide as radio spectrum is a diminishing resource. In many popular public safety bands, the spectrum is virtually exhausted. Narrowbanding[3] will help to some degree in the foreseeable future. Practically speaking, however, the only spectrum state and local agencies will have available for systems expansions or large-systems development falls within the 700 MHz (contiguous with 800 MHz) realm – spectrum which will not be available throughout most of California until February 2009. This poses significant problems because many of California's state agencies employ spectrum in other radio frequency bands.

When armed with a viable plan and full assurances of available funding, California could attempt negotiations with the National Telecommunications and Information Agency (NTIA) which represents the federal government spectrum holdings. There are, however, only a few examples of other states meeting with success in doing so. On occasion, it is also possible to find minimal amounts of spectrum for sale, but it is unlikely that the required amount will be available when it is needed.

➢ Gateways

During the past year, the PSRSPC has been assessing the gateway resources throughout the state in preparation for the grant funded PSRSPC gateway project (purchase of six gateway units for mutual aid use).[4] The assessment findings showed that many local agencies, and some state agencies, owned and operated gateways. Therefore, future effort will concentrate on the development of gateway governance to effectively and efficiently integrate these gateway resources.

Key Accomplishments in 2006

The PSRSPC in coordination with CALSIEC made significant progress in 2006. The accomplishments noted below are highlights from last year; detailed accomplishments relative to the 2006 Strategic Action Plan are contained in Attachment 1 of this report.

➢ Gateway Equipment

In the 2006 strategic plan, the need to identify high-priority, immediate needs for "gateway" bridging technology was recognized in order to increase interoperability "footprints." Basically, mobile gateway equipment allows communications operators to connect several different radios together so first responders can talk to one another when appropriate. The PSRSPC-TWG and CALSIEC jointly evaluated existing interoperability capabilities, and planned for the purchase and deployment of mobile gateway units. (The intent is to extend the program for "mobile

[3] January 1, 2013 is the deadline by which Public Safety Radio Pool licensees operating within the 150-174 MHz [VHF High Band] and 421-512 MHz [also known as UHF band] realms must migrate completely to 12.5 kHz "narrowband" technology.

[4] The basic function of an audio gateway is to interconnect disparate communications devices (typically two-way radios) and allow audio to be patched between any and all of those devices as needed.

communications translators" outlined in Government Code §8588.7 (et. seq.) to at-risk areas throughout the state.) Federal Homeland Security Grant Program funding, allocated by Office of Homeland Security (OHS) for expenditure from October 17, 2006 to March 31, 2008, will enable the procurement and assembly of six gateway units. Based on the interoperability survey results, and the numerous gateway communication devices available throughout the state as displayed in Figure 2 on page 13 (i.e., CHP, Military Department, locally owned gateways), it was determined the best use of these limited resources is deployment through the mission tasking process on an "as needed basis". These units will be made available to the requesting agencies from California's six mutual aid regions during an emergency event.

The gateway project includes the development of product specifications, purchase, and deployment. The six mobile gateway units will be procured and deployed by the end of 2007. The gateway units will be included in future operational exercises, when applicable.

➢ System of Systems

The 2006 strategic plan recognized the need to identify realistic parameters of a "System of Systems" (SoS) that could accommodate and build upon California's existing public safety communications networks. The main goal of this initiative is to develop a "network of systems" that (1) ties existing local and state agency systems together with bridging technology and universal procedures and (2) ensures that future equipment acquisitions meet the criteria identified for effective interoperability and modernization (such as SAFECOM, P25, etc.). The ultimate benefit of a "System of Systems" approach will be the development of communications interoperability/modernization criteria and achievable standardization of the communications structure for the state. A key policy and program challenge revolves around ensuring that these various systems fall within the accepted parameters of what is ultimately defined as "interoperable" – whether referring to equipment or procedural implementations. A defined range of these parameters for California was developed during the Exploratory Market Survey project.

➢ Exploratory Market Survey

As an initial step in developing the SoS, the PSRSPC conducted an exploratory market survey of large-scale public safety wireless voice and data communications systems integrators in May 2006. The goal of the survey was to help formulate the SoS functional requirements. The large-scale integrators interviewed were asked to synopsize how their systems solutions could accommodate:

- Forty-one predefined "System Capabilities" criteria (and, generally, other communications trends alluded to in the SAFECOM Program Statement of Requirements [SoR] Version 1.1 [see http://www.safecomprogram.gov/SAFECOM/ for SAFECOM overview and SoR])
- Communications trends alluded to in the 2006 Report to the Legislature Action Plan and Compendium of References *with emphasis on* how their systems solutions can allow the state to leverage their existing analog state agency communications systems to the greatest degree feasible while evolving incrementally but expediently towards a standards-based, optimized operable and interoperable System of Systems

Survey results indicated that there are various approaches for integrating existing infrastructures, while allowing for a migration path to modernization, and that several large-scale integrators can accommodate the magnitude of effort before the state.

The overarching "System Capabilities" above will be accompanied by specific functional and operational requirements evolving out of survey results and subsequent one-on-one discussions with stakeholders. Under "Requirements Definition" (see Compendium of References, Appendix 2), the forty-one system capabilities are listed. In addition, the Functional and Operational Considerations Checklist that will be employed to verify all stakeholder requirements are accommodated by the developing System of Systems solution (see Compendium of References, Appendix 3).

➢ Statewide Coordination

The 2006 annual report identified the need to develop lasting and coordinated governance that incorporates both existing and new organizational efforts. Key to that effort in California is coordination of the complimentary work of the PSRSPC and CALSIEC. The two committees have worked jointly on several projects including the statewide needs analysis and system capability assessment, gateway project, governance standards and interoperability plans, spectrum management, and System of Systems. This year's annual report was validated through a facilitated review process. CALSIEC members and the public were invited to participate in a videoconference held at three meeting sites (Sacramento, Los Alamitos, and Oakland). The results of that review were presented to the PSRSPC for consideration in this document and/or placed in a work planning structure to be addressed in 2007.

Conclusions

Based on data from the statewide system survey and work accomplished by the PSRSPC in coordination with CALSIEC, a phased approach must be taken to address the following:

- Solutions to immediate operability issues as a critical step towards interoperability.
- Validation of the radio system survey information which is critical to the development of comprehensive functional and operational requirements – the foundation of the System of Systems interoperability concept.
- Governance among all facets of the communication field in California.
- Inclusion of federal agencies operating radio systems in California as follow-up to the system survey.
- Required funding and support to continue the radio system survey, assessment, and validation of information in order for the data to be useful for operable and interoperable radio systems development.
- Grant-funded mobile gateway specifications, procurement and deployment.
- Funding sources for the development of a new approach to improve state owned/operated public safety radio systems and wireless components.
- Continued spectrum analysis related to narrowbanding, wireless broadband, 700MHz, border issues, and gateway licensing.
- Spectrum requirements and availability for the public safety field in California.

➢ Figure 2 – Preliminary Gateway Numbers

Chapter 2 – Where We Want To Go

Vision for California Public Safety Communications

Twenty-first century public safety communications systems are obliged to reflect a different paradigm and a highly coordinated effort among the state's public safety agencies. This represents a marked departure from yesterday's approach to public safety communications. Public safety agencies must now accommodate new organizational structures and modified operational procedures to support their mission. Synergistic systems, structures, and procedures offer greater opportunities for cost efficiencies on achieving practical and seamless interoperability across jurisdictions and disciplines (e.g., law, fire, emergency medical services, and other government services).

California must not only participate, but *lead* in national efforts to standardize how public safety first responders communicate. This includes standard channel naming nomenclature and clear text dispatch that will assist nationwide requests for assistance. In addition, common definitions are important, such as the term interoperability which is defined as "the ability for public safety first responders to communicate with whom they need to, when they need to, when authorized."

California's vision for the future for public safety communications must provide its citizens with the assurance of efficient, coordinated response in the event of a disaster. As the eighth largest economy in the world, with precious resources, national parks, industry, ports and highways, California cannot afford to be complacent in its steps to provide true interoperability among all public safety first responders when planning for potential natural or man-made disasters. Developing a statewide interoperable public safety communications system became a critical component of California's defense against terrorism after the September 11th attacks. The communications problems, which were evident during the event and a contributing factor to the tragic loss of life, have shown us how essential communication is between public safety responders in these situations. This deficiency was brought to the forefront again during the 2005 hurricane season when Hurricane Katrina hit the Gulf Coast region. It is only a matter of time before California suffers a catastrophic emergency. In fact, some of the state's 2005 statistical information indicates that California has suffered more than fifty percent (50%) of the nation's federally declared disasters over the past ten years. California cannot afford to wait for a disaster to occur before it pursues a method for a statewide, interoperable communications system for public safety personnel.

Radio communication is one of the most essential tools in the daily efforts of public safety providers. California's public safety agencies' radio communications systems are crippled by a lack of interoperability, channel congestion, aging equipment, inadequate funding, and limited functionality. Without effective and reliable radio communications, the citizens of California, and those sworn to protect them, are increasingly placed at risk. Faced with this situation, the Public Safety Radio Strategic Planning Committee (PSRSPC) is working collaboratively with the California Statewide Interoperability Executive Committee (CALSIEC) and constituent organizations to develop a cohesive, cost-effective strategy for improved public safety communications. Together this caucus is focusing on the development of the most effective technological and organizational approaches to meet public safety agencies' combined

communications needs. The two-pronged priority efforts are: achieving equipment modernization and developing management systems for coordinated use—both efforts require a new level of dedicated funding and focus that reflects the importance to California's overall public safety.

The State of California's public safety radio communications systems must accommodate all state agencies with an integrated platform and operating system that enables seamless communications. To the greatest extent practical, this system will anticipate and allow for the integration of emerging technologies. California has adopted the Federal Department of Homeland Security's SAFECOM model for public safety communities. This includes their Statement of Requirements (SoR) and the Interoperability Continuum as the state's foundation of accomplishing these goals.

➢ Leadership, Planning, Collaboration and Sustainability

The importance of leadership cannot be over emphasized. The State of California has a responsibility to provide leadership and act as a center of excellence for radio communications interoperability and governance advances. As such, the state is responsible for assisting agencies or regions facing difficulties relating to political issues, relationships within or across jurisdictions and disciplines, education, and outreach. State leadership can help work through these challenging conflicts as well as set the stage for commitment to the interoperability effort. A willingness to commit the time and resources necessary to ensure interoperability success is vital.

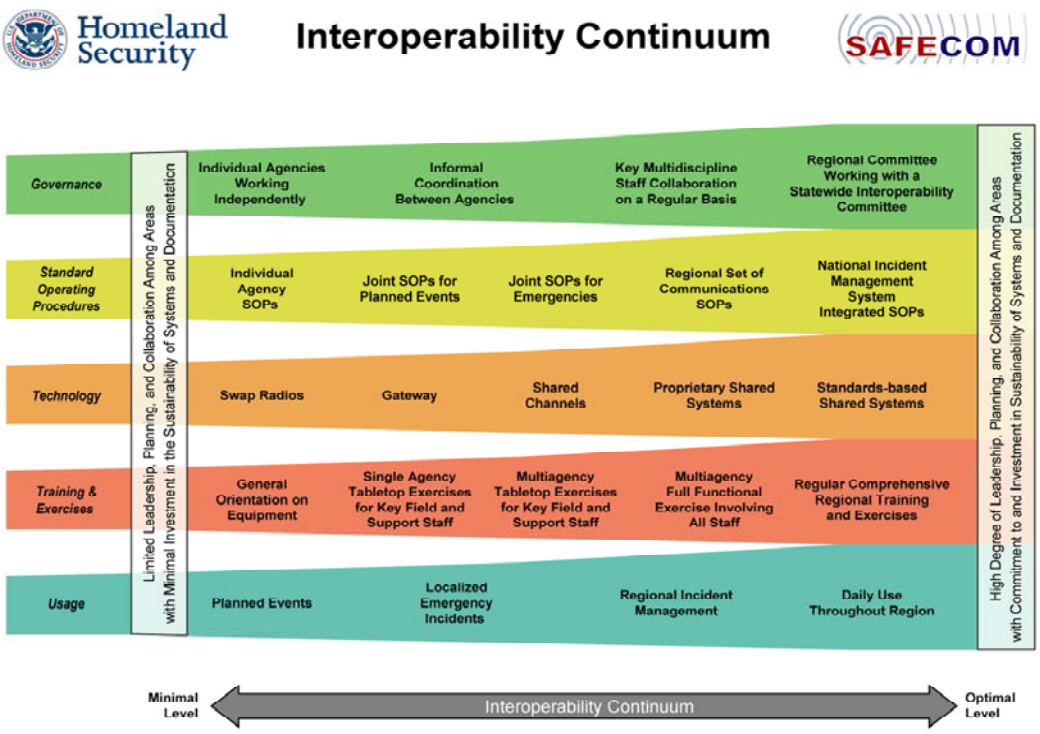
Key issues are to gain a true leadership commitment from all disciplines; foster collaboration across all levels of government; partner with policy makers and find a reliable advocate; promote funding solutions; plan and budget for sustainable methods to provide needed upgrades; and ensure coordination across all Interoperability Continuum elements.

The PSRSPC's Annual Report to the Legislature serves as the state's strategic plan to establish a statewide, integrated, interoperable public safety communications network. The plan includes goals that identify resource needs which include data formats, sustained funding source(s) and how to prioritize expenditures; methods to develop common protocols that build upon industry and governmental standards; and implementation strategies and timelines to achieve the goals and objectives set forth in the report. The report will provide progress updates on acknowledged strategies, goals and objectives; collaborations with other agencies to develop, operate and monitor statewide efforts; and recommendations on resource coordination and common protocol advancements to integrate local as well as statewide interoperable communications. There will also be a complete listing of radio communications equipment purchases by state departments for which a waiver was granted by PSRSPC.

In accordance with the Interoperability Continuum, developing strong partnerships with one or more local agencies with large integrated systems should be an option that allows state members to subscribe to these successful systems. This should be strongly encouraged as it is cost effective and promotes the System of Systems concept. It could also permit any realized cost savings to be allocated to other areas where operability may be a bigger concern.

SAFECOM's Interoperability Continuum (shown below) defines five critical elements of interoperability success which include governance, standard operating procedures, technology, training and exercises, and usage. These elements must be addressed in tandem to develop robust

interoperability solutions. In order to have a true picture of interoperability, progress along all elements must be considered together, as they are interdependent.



➢ Governance

Governance refers to establishing a shared vision and an effective organizational structure to support any project or initiative through common policies, processes, and procedures. A common governance structure improves communications, coordination and cooperation across regions and disciplines that are essential in achieving an acceptable level of communications interoperability. PSRSPC is working to create a joint governance work group with the CalSIEC that will consist of local, state, tribal, and federal entities as well as representatives from public safety disciplines within the state. PSRSPC is working to support this governance structure by developing a clear charter and shared mission statement, adopting an action plan, coordinating statewide key initiatives and goals, and educating potential political advocates.

➢ Standard Operating Procedures

Standard operating procedures (SOP) are formal written guidelines or instructions for incident response. SOPs typically have both operational and technical components and enable first responders to act in a coordinated fashion across disciplines in the event of an emergency. This introduces the opportunity to assemble an SOP committee; develop and implement local and regional responses; and then test, evaluate and manage the procedures.

California has a long history of standardized response, including development of an Incident Command System (ICS) in the 1970s by fire services in southern California and California's all hazards/all disciplines Standardized Emergency Management System (SEMS) in the 1990s. Much

of the success of these systems is a result of SOPs, which will be key to the success of interoperable communications as well.

➢ Technology

Technology refers to equipment, infrastructure, networks, and applications that public safety disciplines use to exchange critical information as they respond to emergency incidents. Some of the other technology elements to consider when improving communications and interoperability include conducting an inventory to identify user requirements, evaluating the findings and identifying vulnerable targets, coordinating new partnerships to maximize existing infrastructure and resources, providing a statewide wireless data system, and continuing planning efforts to support, maintain and optimize solutions for operability, replacement of current systems, and enhancement as new technologies emerge.

The envisioned system will facilitate communications regardless of technologies, infrastructures, or frequency bands encountered. It will allow first responders to transparently communicate. This will include the ability to coordinate without system access (off network to units within range) as well as with other jurisdictions in the same geographical area. This statewide system will allow guest user access (after validating user identification and authorization) to pertinent first responder talk groups and networks.

Some of the other capabilities include emergency voice communications; emergency signaling; emergency notifications; secure, encrypted voice and data communications; on-scene data query, access, exchange, and transfer, field image capture and distribution; remote system administration; and resilient/redundant functional requirements that provide reliable system performance.

Initially, the most critical priority for public safety agencies is to ensure the operability of their existing systems. Operability cannot be overlooked, as many existing communications systems have reached or gone well beyond their life expectancy. A significant number of equipment components are in need of upgrades and replacement within current systems. This can only be accomplished over an extended period of time with coordinated planning and funding.

Short and long term solutions must be identified. One of California's short-term solutions is to deploy both fixed and mobile audio gateways strategically throughout the state. These gateways will supply an interim short-term answer to regions without interoperable communications systems during a disaster event. In addition, the gateways will use different radio frequencies to provide a more coordinated response to agencies that cannot readily communicate by any other means. A gateway, also known as a black box, connects disparate telecommunications devices together so first responders are able to talk to one another at the scene of an incident. It does not achieve the ultimate SAFECOM goal of standards-based shared systems statewide, but it can be used until seamless interoperability can be achieved statewide.

➢ Training and Exercises

Training and Exercises refers to the instructional support designed to develop and retain the knowledge, skills, and performance of public safety personnel. Proper training and regular exercises are critical to the implementation and maintenance of a successful interoperable system. General orientation of equipment, tabletop exercises for key field and support staff, and on-going,

comprehensive regional training and exercises should be regularly scheduled. Effective training programs and exercises that practice communications interoperability are essential in ensuring the technology works and that responders use it effectively during emergency operations. The old adage of "practice makes perfect" is fundamental in these planning efforts.

Local, regional, and statewide after action reports are needed to document progress. Only a means to ensure that a straightforward, real-world analysis occurs will verify the forward momentum and reliable advancement of the state efforts. Anything less could hamper future training as only an honest assessment can identify potential high-risk concerns and address actual needs for those most at risk. It is time to share local, regional, and statewide shortcomings among public safety participants as this will improve the knowledge base of personnel statewide.

➢ Usage

Success of system usage is contingent upon how well other Interoperability Continuum elements are integrated and developed. The continuum is used to evaluate the current state of communications interoperability and to gauge its improvement over time. The ultimate goal of usage is to access the interoperability aspect of the California System of Systems on a daily basis and keep first responders are abreast of current protocols, equipment operations and techniques. Users can then remain familiar with the system's interoperability capabilities, facilitating its use when necessary. Communications systems' familiarity is imperative for a cohesive, timely, efficient response to any request for assistance.

➢ California's Challenge

Much remains to be accomplished in the arena of statewide public safety radio communications. We have only begun the journey towards clear leadership, cohesive planning, better coordination, standards-based technology, regional training and routine usage. In California, the public safety community is keenly aware of existing communications shortfalls and strongly supports statewide efforts to advance interoperability. It is time to comprehensively identify a means for our pubic safety communities to successfully respond in unison, as needed, to serve the citizens of California.

Priority Initiatives

The priority initiatives identified below are critical to the progress of the state's move towards interoperability. Permanent funding is paramount to governance of a dynamic California public safety communications and operable/interoperable infrastructure. The PSRSPC also recognizes that ongoing support of those agencies that are spearheading the process is necessary for successful modernization and maintenance of California's communications infrastructure.

➢ Funding

Funding is essential for California to maintain communications operability and to improve interoperability throughout the state. Additionally, significant challenges continue to exist which require an enormous amount of time and effort by OES and the members of PSRSPC and CALSIEC to ensure progress.

In September of 2007 the U.S. Department of Homeland Security will begin a phased allocation of almost $1 billion in grants specifically earmarked for purchasing Project 25 capable radio communications equipment that supports interoperability. Based on the Memorandum of Understanding that was signed by the U.S. Department of Commerce and the Department of Homeland Security, PSRSPC does not anticipate that the states will be allowed to spend the grant money on critical radio operability needs. This $1 billion will be allocated based on a competitive application process among all of the U.S. states and territories.

While the PSRSPC will pursue this and other federal funding when eligible, the magnitude of the communications replacement, modernization, maintenance, staff, and training costs requires a continuous, dedicated funding source year after year. The committee intends to support departments' existing funding proposals in order to allow them to address their critical operating needs, while ensuring the project proposals are coordinated through the PSRSPC for consistency with the committee's objectives.

Since Fiscal Year 2004-05, the PSRSPC agencies have collectively spent more than $67 million supporting the Committee work effort with staff time and consultant resources, and purchasing equipment to bolster the operability of obsolete radio communications systems. Much of the money used to support this spending came from one-year and multi-year budget augmentations from the State's General Fund as well as Federal Homeland Security Grant Funding.

As mentioned above, one of PSRSPC's successes of 2006 was the completion of a statewide radio systems assessment. This has provided valuable insight to the needs of both state and local public safety radio systems operators. In this year's strategic goals, we have defined a plan to take this information and create a coordinated budget package that will be submitted to the Governor's Emergency Operations Executive Council for review and final recommendation to the Governor.

Based on the information gathered from the statewide assessment, three areas have been identified as critical: (1) two-year critical operability funding needs for the PSRSPC state agencies that operate radio systems; (2) funding for limited-term personnel to support improved governance and coordinated planning efforts; and (3) a renewable funding methodology for long-term viability.

➢ Two Year Critical Operability Funding – Initial Estimate

Investment is needed to develop a new approach to improve state owned/operated public safety radio and wireless components, as well as the ongoing modernization of local systems, to ensure that future radio systems serving California achieve robust interoperability. As a first step towards interoperability, the PSRSPC has identified an initial estimate of state agency funding needs to meet critical operability requirements over the next two years. The need for this investment is supported by the statewide system survey which showed obsolescence rates of 47 to 81 percent for seven categories of state agency radio equipment (see Chapter 1). It is important to note that more funding will be needed over time to achieve and sustain full operability.

Criteria considered when determining the need for equipment replacement were:

- Critical infrastructure required replacement
- Recommended lifespan of equipment

- Lack of vendor support/inability to repair
- Obsolescence
- Statutory requirement

Using these criteria, the state agencies provided initial information on their specific equipment replacement or upgrade requirements, including DGS engineering, and installation and training costs. The unfunded two-year initial estimate for the PSRSPC agencies operating radio systems is approximately $85 million. Comprehensive detailed projections from each agency will be required to finalize this estimate.

➢ Two Year Governance Funding – Initial Estimate

The Federal Department of Homeland Security has recently moved up the deadline for states to submit their Statewide Communications Interoperability Plans from December 31, 2007 to November 1, 2007. This will have a significant effect on staff time across the PSRSPC agencies, specifically on efforts to complete the Regional Tactical Interoperable Communications Plans (TICPs) which will provide us with a foundation for creating the California Statewide Communications Interoperability Plan (CalSCIP) will need to be accelerated. Along with creating both the TICPs and the CalSCIP, PSRSPC is finalizing project plans for the procurement and deployment of the six aforementioned gateway devices.

PSRSPC's 2006 strategic plan recognized the importance of securing funding for critical governance, consistent coordination, and planning support of the PSRSPC and CALSIEC, including funding options for interoperability strategic planning and management of staff and executive projects. This new workload further compounds existing challenges which require an enormous amount of time and effort by OES, PSRSPC, and CALSIEC. The benefits of this work effort include:

- Annual Report development
- CALSIEC planning area meetings
- Executive meeting coordination
- Legislative bill analyses
- Statewide equipment and interoperability assessment, development, and analysis
- Gateway specifications
- PSRSPC meeting coordination
- Review of Technical Project Plans
- System of Systems standards development, evaluation and strategies
- Tactical Interoperable Communication Plans (TICPs) coordination
- Strategic/Work Plan and Reports
- Work teams
- Web publications, announcements, and essential links

The PSRSPC determined that the following activities are carried out by the state agency members as part of their "governance" work effort:

- Analytical work (e.g., defining purchasing specifications, survey analysis)

- Conferences
- Consultant fees
- Legal fees
- Legislatively required activities
- Liaison
- Meetings
- Outreach
- Procurement (e.g., radios, communication components)
- Products developed (e.g., project plans, reports, system designs)
- Training
- Travel
- Website

The estimate for annual workload for each of the next two fiscal years is a total of 20 limited-term personnel years for PSRSPC agencies. This is an initial estimate that will need to be updated as California continues on the path to interoperability.

Since 2005, each state agency has attempted to supply approximately 0.5 PY of staff time per year to the work efforts of the PSRSPC. However, staff are often taken away from their PSRSPC responsibilities to respond to the increased demand of their agency's other projects. This has had a lasting effect on the PSRSPC project timeline. With the foreseeable increase in workload over the next two years, this additional staff will be necessary to meeting the strategic goals outlined in this report.

➢ Sustained Funding

The 2006 strategic plan identified the need to pursue a phased, renewable, and priority-based funding strategy for California's public safety communications physical infrastructure and governance. Ultimately, the costs will likely require a combination of federal and state funds. It is the intent of the committee to support existing funding proposals in order to allow departments to address critical needs, while at the same time coordinating such initiatives through the PSRSPC to ensure consistency and collaboration. In addition, the PSRSPC took into consideration funding models that could potentially support public safety communications interoperability at the local and regional levels. To that end the PSRSPC considered a variety of funding options, as well as the funding methodologies of other states. Virtually every emergency response requires a multi-discipline, multi-agency response to be effective. It is critical that all levels of government be considered as California seeks a sustained funding mechanism to modernize and maintain its public safety communications infrastructure. The PSRSPC Fiscal Work Group interviewed other key state and local interoperability coordinators on challenges faced to fund their interoperability projects (see Attachment 2, "Summary of Interviews with Other State and Local Governments").

➢ Sustained Funding Source Options

Type	Considerations
Public Safety Communications Surcharge	➢ Renewable funding source** ➢ 911 Type fund (Utilities Model) has been successful in other states* ➢ Recent decrease in surcharges, i.e., federal tax rescinded ➢ Possible regulatory issues, e.g., some phone services may not be included ➢ Potential funding for the 58 Operational Areas ➢ Utilities Model can be used at both the state and local levels ➢ 911 fund has call volume as a funding base ➢ 911 funding source would have direct correlation with the service being provided ➢ Would not negatively impact the General Fund
General Fund Recurring Fixed Line Item Model	➢ Ongoing funding source ➢ Limited General Fund money ➢ Inconsistent funding source
General Fund Subscriber Fee Model	➢ Ongoing funding source ➢ Limited General Fund money ➢ Money would be redirected from Agency budgets ➢ Inconsistent funding source ➢ Would have to assess local government subscriber fees
Federal Funds	➢ Quick upfront money ➢ Good as "short-term" funding source for one-time project expenses because of short spending timelines and lack of reliability ➢ No or little spending allowed for maintenance, personnel, installation, etc. ➢ Could be one source of funding, but not the primary source ➢ Not preferred as a long-term funding strategy ➢ Would not negatively impact the General Fund
Bond Funds	➢ Quick upfront money ➢ Bond measures are hard to pass ➢ Typically results in one-time funding which is not beneficial to a long-term phased project ➢ Would not negatively impact the General Fund

* New York: E 911 tax, Minnesota: 911 fee
Arkansas, Florida, Illinois, Indiana: Increased fee on yearly license renewal
Arizona: Sales tax increase
New Jersey, Rhode Island, Utah, Virginia: Bonds
Alaska, New Hampshire: Federal funding
Iowa, Ohio, Pennsylvania: General fund appropriations

** More information is provided in Attachment 2

➢ Governance

➢ Staff and Agency Multi-jurisdictional, Multidiscipline Collaboration Statewide

As defined by SAFECOM, governance refers to establishing a shared vision and an effective organizational structure to support any project or initiative through common policies, processes, and procedures. The 2006 Strategic Plan recognized the criticality of "governance" in its initiative to "develop lasting and coordinated governance for integrated statewide public safety voice and data communication systems that incorporates both existing and new organizational efforts." State and regional level memoranda of understanding/interoperable communications plans are being assimilated, evaluated, and defined within the larger scope of California's evolving Statewide Communications Interoperability Plan.

➢ California Tactical Interoperable Communications Plans (TICPs)

Tactical interoperable communications is defined as the rapid provision of on-scene, incident- based, mission critical voice communications among all first-responder agencies (e.g., EMS, fire and law enforcement), as appropriate for the incident, and in support of an incident command system as defined in the National Incident Management System (NIMS). Bulleted below are many aspects of tactical interoperable communications that should be incorporated into the development of a TICP:

- Tactical interoperable communications may be provided through the use of common equipment (common channels, cached radios or shared systems) or a gateway between dissimilar systems and/or radio frequency bands;
- Tactical interoperable communications may use fixed and/or mobile/portable solution(s).
- Tactical interoperable communications must be rapidly deployable at any time (24/7).
- Tactical interoperable communications should be fully operational within an hour of an incident occurring.
- Tactical interoperable communications requires oversight by trained Communications Unit Leaders, as defined within the NIMS, to support equipment deployment.
- Tactical interoperable communications plans should always support long-term interoperability by building upon or accelerating long-term strategies and efforts.

PSPSPC is working collaboratively with CALSIEC regional representatives[5] in documenting and refining existing tactical interoperable practices, to fit California's adopted template, and in providing guidance to the extent necessary throughout the TICP development process.

➢ California Statewide Communications Interoperability Plan (CALSCIP)

The lack of interoperable wireless communications is an issue plaguing public safety agencies in communities across the state. In many cases, agencies cannot perform their

[5] Regional representatives comprise representatives from all public safety stakeholders within a localized area having a need to communicate during a typical incident.

mission critical duties. Many are unable to share critical voice or data information via radio with other jurisdictions in day-to-day operations and emergency response to incidents. Communications interoperability is defined as the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, when needed and as authorized.

By November 1, 2007, as a condition of the Federal Homeland Security Grant Program (HSGP), each state is required to develop a Statewide Communications Interoperability Plan (SCIP) - a strategic plan for improving statewide interoperable communications focusing on issues including:

- Improving the ability of public safety officers to save lives and property,
- Facilitating rapid and efficient interaction among all public safety organizations, and
- Providing immediate and coordinated assistance in day-to-day missions, task force operations, and mass-casualty incidents.

The PSRSPC recognizes that any successful effort to improve public safety interoperability must be driven by the local public safety community. A one size fits all solution to the interoperability issue, mandated from the federal or state level down, will not solve the problem. To accommodate local requirements and ensure congruity throughout California, the PSRSPC is working in collaboration with the CALSIEC[6] to develop this plan for California. California's planning process will be driven from the local level up and focus on building support for the plan at every level of government.

The PSRSPC, in collaboration with CALSIEC, intends to emulate the SAFECOM model Statewide Communications Interoperability Plan methodology which identifies the phases for developing a statewide plan, critical tasks under each phase, realistic timeframes during which associated tasks can be completed, and lessons learned during the California planning process. California's SCIP will accommodate gateway governance as well as the urban and regional area TICPs and other local communications plans.

➢ System of Systems

The envisioned California System of Systems (SoS) will be realized through the amalgamation of disparate communications systems statewide via digital networking technologies into a linked infrastructure (or network) capable of supporting interoperable communications. California SoS development requires that communications equipment purchases by any of the network participants be standards-based and forward migration capable to the greatest extent practical. This will ultimately facilitate achieving the SAFECOM technology end goal of all network participants operating on standards-based, shared systems. The SoS digital network will be capable of being configured to accommodate a diversity of wireless and wire line communications technologies and connectivity, including satellite, broadband, and internet provider-based.

[6] CALSIEC is tasked with managing the state and federally designated interoperability (mutual aid) spectrum on behalf of all of California's public safety first responders.

➢ SAFECOM's Optimal Technology Solutions

A standards-based, shared systems approach is the most cost-effective means of obtaining enhanced system functionality and the most effective way of pursuing and utilizing new spectrum allocations. "Regional shared systems are the optimal solution to interoperability. While proprietary systems limit the user's choice of product with regard to manufacturer and competitive procurement, standards-based shared systems promote competitive procurement and a wide selection of products to meet specific user needs. With proper planning of the talk group architecture, interoperability is provided as a byproduct of system design, creating an optimal technology solution." [7]

➢ Achieving SAFECOM's Technology Recommendations in California

It has been determined, however, that California is neither operationally nor fiscally able to accommodate the significant investment of time and annual outlay necessary to evolve directly to a standards-based common infrastructure, as evidenced in recent years by critical staffing and cash-flow shortages.

What California can do is move towards a standards-based shared systems incrementally by:

- maintaining and upgrading its current independent systems (through the use of standards-based, interoperable, forward-migratable technologies to the extent practicable) to maintain and improve operability;
- linking the independent agency systems via networking technologies to form a "System of Systems" to improve interoperability; and
- transitioning to common systems via sharing agreements over time.

Relative to the first bullet, in the late 1990s the PSRSPC noted in its cost-benefit analysis that although merely continuing development of independent systems by the state departments can address many needs, it will cost significantly more than the implementation of shared infrastructure(s). In addition, this independent approach does not enhance critically needed interoperability nor does it promote operational efficiencies. The departments will also have difficulty acquiring additional spectrum from the FCC which is requiring more shared systems to alleviate channel congestion.

However, posturing for the future by incrementally replacing existing equipment with standards-based modern equipment when necessary, as Government Code now requires, will facilitate a transition to agency participation on shared systems as state agencies elect to exercise the option.

Through these efforts and working in collaboration with CALSIEC, PSRSPC's vision is to ensure that all local, regional, state, and federal public safety agency first-responders operating within California will be able to communicate using compatible systems, in real time, across disciplines and jurisdictions, to respond more effectively during day-to-day operations and major emergency situations. For state agencies, major milestones in

[7] Excerpt from the SAFECOM Program Interoperability Continuum – A tool for improving emergency response communications and interoperability

achieving this goal comprise the time projections for the first two bullets above; that is, maintaining and upgrading its current independent systems and linking the independent agency systems via networking technologies. These can be accomplished concurrently and should both be completed within ten years, or by 2017.

Also driving milestone dates, the State of California holds a license for 96 each 12.5 kHz channel pairs in the 700 MHz realm. Two currently[8] applicable benchmark conditions under which the state may retain the license exist. The state is required to certify on or before the first benchmark date (currently January 2012), that it is providing or prepared to provide "substantial service" to one-third of California's population or territory, and that on or before the second benchmark date (currently January 2017), that it is providing or prepared to provide "substantial service" to two-thirds of California's population or territory.

➢ Spectrum

The PSRSPC-TWG has established a Spectrum Work Team as required in the 2006 strategic plan. The focus of the Spectrum Work Team is to: (1) assess current and future spectrum requirements of the PSRSPC state agencies and determine available spectrum resources; (2) work with DGS to pursue additional spectrum resources if needed; (3) provide the PSRSPC with public safety spectrum-related legislative information and trends; and (4) advocate the use of spectrally efficient technologies for the benefit of the state public safety agencies.

The Spectrum Work Team explored national issues as they pertain to California, reporting on contemporary issues under analysis by public safety delegate organizations. There are major tasks included below that must be accomplished under FCC regulations.

➢ Narrowbanding below 512 MHz

Narrowbanding is intended to promote spectrum efficient technologies on certain FCC Part 90 frequencies. Imminent related requirements include:

- "…single-mode and multi-mode transmitters designed to operate in the 150-174 MHz and 421-512 MHz bands that operate with a maximum channel bandwidth greater than 12.5 kHz shall not be manufactured in, or imported into, the United States after January 1, 2011…"
- January 1, 2013 is the deadline by which Public Safety Radio Pool licensees operating in the 150-174 MHz and 421-512 MHz bands must migrate completely to 12.5 kHz narrowband technology.

➢ Wireless Broadband

- Focusing on the development of broadband public safety communications capabilities.
- Reviewing technology, security, applications, prioritization, and spectrum management concerns.

[8] The ruling (circa 2001) was based upon the condition-based assumption incumbent TV broadcasters would vacate the spectrum by 2007. A "date certain" of February 2009 was established more recently, which may make a case for a two-year extension on the current benchmark date requirement if it is deemed necessary.

➢ 700 MHz Advocacy

The 700 MHz allocation is a large, new public safety spectrum block effectively blocked for use in California until February 2009. Its advocacy entails:

- Promoting equitable and efficient uses of 700 MHz spectrum for state public safety agencies.
- Facilitating the outreach to the public safety stakeholders and government decision makers on 700 MHz issues.

➢ Border Issues

- Focusing on Mexican border area and adjacent states for public safety communications issues.

➢ Gateway Licensing

- Studied the relevant rules and regulations regarding the operation and licensing of radio channels in both fixed and mobile gateway solutions and developed a course of action to address this situation. Licensing issues and geographical restrictions attending the use of individual agencies' dispatch frequencies lead the PSRSPC to recommend that gateways be provisioned on only those frequencies identified for statewide mutual aid and interoperability operations. (See Compendium of References, Appendix 4 for discussion of FCC issues)

➢ Spectrum Alternatives

- Seeking potential alternative sources for spectrum (e.g., NTIA, commercial availability, et cetera). Actually pursuing these alternatives requires a viable plan and/or full assurances of available funding.

Chapter 3 – How We Get There

Interoperability System of Systems Project Schedule

All of the goals outlined in this report have the same purpose: to make California's public safety communications systems interoperable. The most crucial element of making California interoperable will be to design, procure and deploy a "SoS." PSRSPC is estimating that the "SoS" will cost between $4 and $6 billion. It is hard to put an exact figure on the cost of the "SoS" because the technology is very new and rapidly expanding. There have been and will continue to be many mandates and decisions at the federal level effecting the use of spectrum as well as setting standards for equipment. Many states have started to design interoperable systems, but none of them face the same challenges as California.

The "SoS" will be a interoperability project that is unmatched in size and scope in the U.S. and possibly the world. Because of its magnitude, it's timeline for design, procurement, and deployment is approximately ten years from receipt of funding. The following is a summary of the "SoS" project phases:

Acquisition Phase	Purpose of Phase
Initiation	
Definition	Characterize PM organization; Establish inter-agency reporting relationships, Develop Chains of Command, et cetera
Planning	Develop and Baseline Scope, Schedule and Cost Set
	Phase 1: Technical Program Planning and Control
	Phase 2: System Engineering Process
	Phase 3: Engineering Integration of Design and Test Plans
Pre-implementation	Refine Requirements; Conceptual Studies; Investigation of Alternative Solutions
	Concept(s) Selection
Implementation	Identify and Analyze Major System Alternatives (Concept Demonstration & Validation)
	Site Selection, Acquisition, and Development
	Spectrum Acquisition
	Project Go Ahead
Full Scale Development	Establish Designs, Standards, and Terms & Conditions for Selected Systems Alternatives
	Produce Design Documentation
	Produce RFP(s) and/or RFQ(s)
	Production Ratification
Production/Development	Site and Systems Construction
	Solicit Responses to RFP(s) and/or RFQ(s) through Wait Out Protest Period
	Issue Notice(s) To Proceed (for Radio Systems)
	Construct Sites, then Systems
	Deploy Operating Capability
Operation & Support	User Support Modifications & Product Improvements

Interoperability Timeline – An Overview

The PSRSPC has adopted aggressive communications system-related implementation goals to achieve interoperability for California as described below and displayed in Figure 3 on page 29. The associated milestone dates selected have little flexibility as they are driven by grant requirements, FCC rulings, and equipment functionality needs. The goals are broken into near-term and long-term efforts with two ongoing activities that are essential to reaching the stated goals:

- Bolster the confidence and participation of local, state, tribal, and federal public safety practitioners statewide by demonstrating consistent world-class leadership throughout California.
- Work in collaboration with CALSIEC and develop an institutionalized system for coordination, issue resolution, and ongoing planning addressing all of California's communication needs.

Near-term Goals

➢ One year goals – 2007

- CALSCIP - By the end of 2007, as a condition of the federal Homeland Security Grant Program (HSGP), California will develop CALSCIP - a plan for improving and standardizing statewide interoperable communications. It will combine the planning efforts of both local and state government under the direction of the Federal Department of Homeland Security's SAFECOM interoperability guidelines. Work on this project has already started at the local level by CALSIEC to ensure support from every level of government.
- TICP - In coordination with CALSIEC, the PSRSPC will facilitate the development of TICPs among local jurisdictions across the state. This effort will include continued coordination with the Urban Area Security Initiative (UASI) TICPs that have already been developed.
- Gateways – Deploy a total of six mobile gateway units throughout the state – one to each of the state's six mutual aid regions.
- National-Level Partnerships: Further enhance California's partnership with the Department of Homeland Security (DHS) to maximize available resources in the achievement of both statewide and nationwide interoperability.

➢ Two year goals - 2009

- 700 MHz Planning - The 700 MHz block of 24 MHz of spectrum conditionally allocated to public safety in 1998 will finally be available throughout California when the incumbent TV broadcasters vacate it in February 2009. Some state agencies already have equipment that can operate on the 700MHz band. Forward planning for the implementation of the state's portion of this key resource is imperative if the state is to meet the aggressive implementation conditions imposed on its use (see specifics in five year goals).
- Critical Operability Funding - Funding is essential for California to maintain state public safety communications operability and to improve interoperability throughout the state. PSRSPC agencies have identified state critical communications systems-related

operability and governance funding requirements which need to be addressed immediately. Within the next two-years, PSRSPC state agencies operating public safety radio systems require funding to mitigate these critical communications system needs.

➢ Five year goals - 2012

- Narrowbanding Mandates - January 1, 2013 is the deadline by which Public Safety Radio Pool licensees operating in the 150-174 MHz and 421-512 MHz bands must migrate completely to 12.5 kHz narrowband technology. This affects all PSRSPC agencies operating public safety communications systems in the targeted bands. These agencies ***must*** migrate to narrowband communications system equipment by the end of 2012. The PSRSPC is targeting the beginning of 2012 (five years hence) for completion of this critical migration allowing for unforeseen developments to be accommodated in the sixth year if necessary.
- 700 MHz Deployment / Phase I - The state is required to certify on or before the first benchmark date (currently January 2012), that it is providing or prepared to provide "substantial service" to one-third of California's population or territory. The forward planning identified as a two-year goal above will need to be acted on before 2012 to meet the FCC requirement; that is, significant 700 MHZ deployments need to take place within the next five years.

Long-term Goals

➢ Ten year goals - 2017

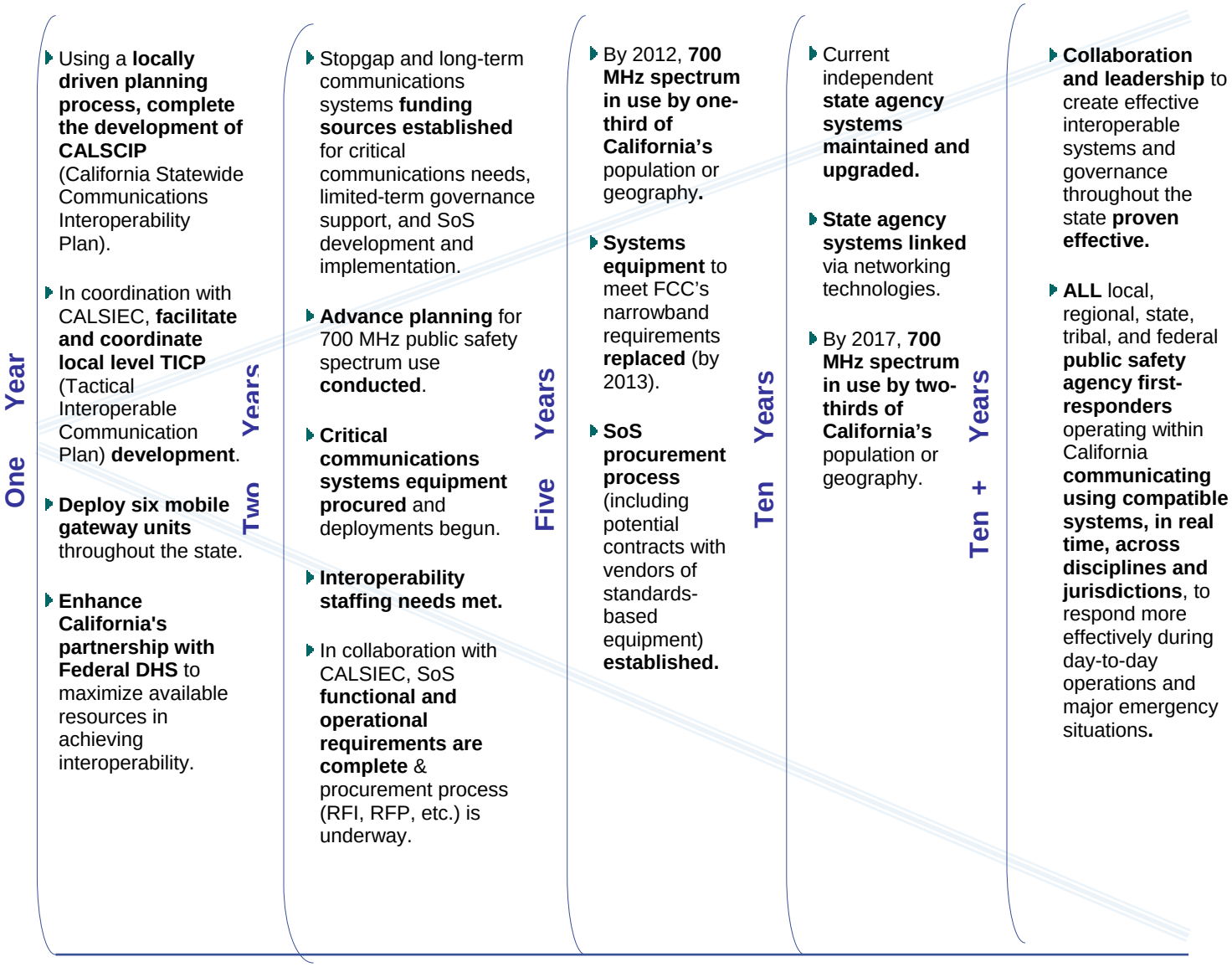
- Systems Upgraded and Networked - For state agencies, maintain and upgrade current independent systems and link the independent agency systems via networking technologies[9].
- 700 MHz Deployment / Phase II - As indicated above, the state is required to certify on or before the second benchmark date (currently January 2017), that it is providing or prepared to provide "substantial service" to two-thirds of California's population or territory. The forward planning identified as a two-year goal above will need to be acted on before 2017 to meet the FCC requirement; that is, the bulk of the 700 MHz deployments need to be completed within the next ten years.

➢ Out year goals – 2017+

- Comprehensive Statewide Interoperability - When interfacing with California public safety practitioners, advocate working towards the goal of ensuring that ALL local, regional, state, tribal, and federal public safety agency first-responders operating within California will be able to communicate using compatible systems, in real time, across disciplines and jurisdictions, to respond more effectively during day-to-day operations and major emergency situations.

[9] Regarding networking the independent agency systems, in an exploratory market survey the PSRSPC conducted this year, several large-scale integrators provided capabilities briefings assuring the state that they have the technology solutions and/or wherewithal to accommodate networking solutions that will allow the state a variety of capabilities – among them interoperability.

➢ Figure 3 – Interoperability Milestones



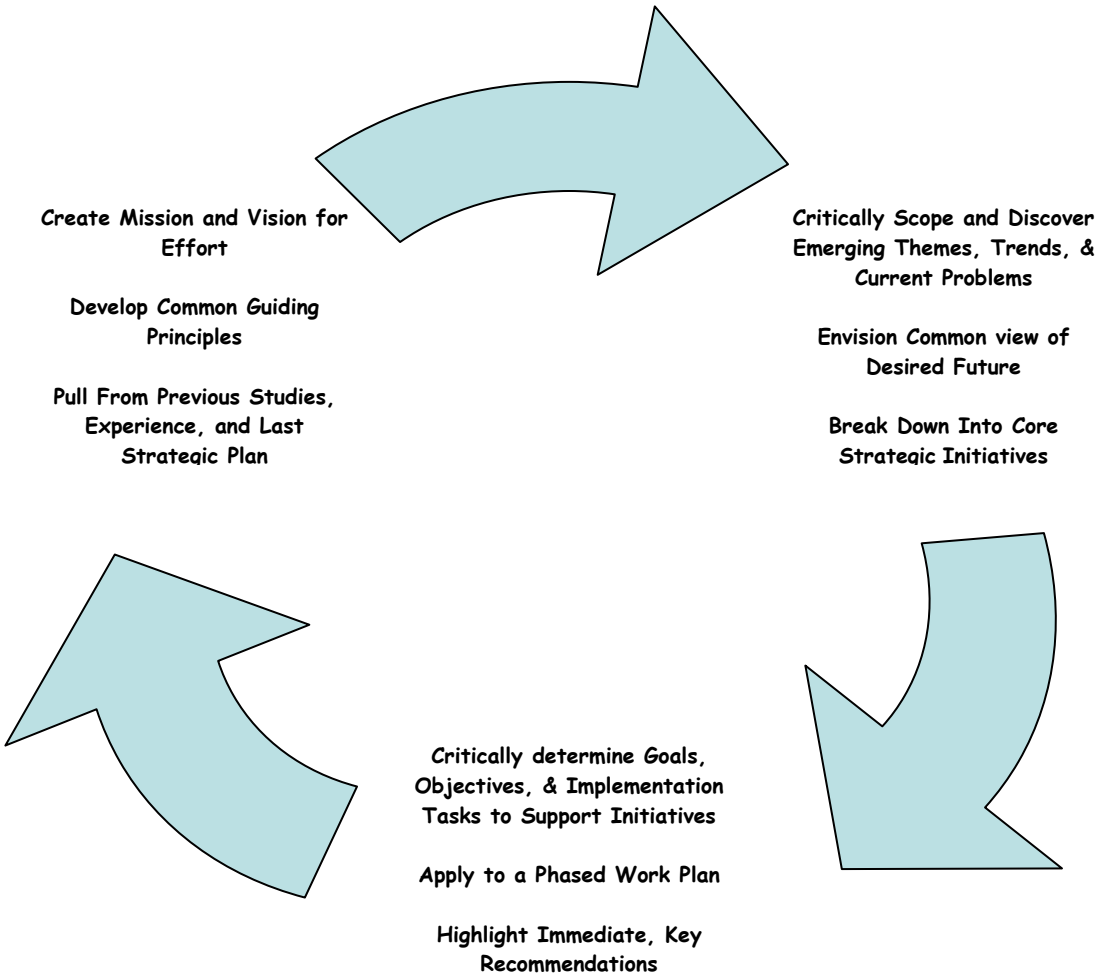
On Going

- **Bolster confidence and participation** of local, state, federal, and tribal public safety practitioners
- In collaboration with CALSIEC, **develop institutionalized system** addressing all of California's communication needs.

Strategic Planning

The PSRSPC has continued to use the strategic planning model it proposed in last year's report (see Figure 4 below). The action plan outlined for 2007 below is the result of using this model over the past year to identify trends and desired goals and objectives.

➢ Figure 4 - Strategic Planning Organizational Learning Process



2007 Strategic Action Plan

The 2007 Strategic Action Plan builds on achievements in 2006 and describes the status of activities in progress and knowledge gained as a result of the needs analysis and assessment and work with key stakeholders. **The stated timeframes and outcomes are projections to accomplish the 2007 goals and objectives and are contingent on adequate funding and staff specifically and solely dedicated to these initiatives.**

➢ Goal 1: Leadership: Establish an effective leadership structure

OBJECTIVES:

1.1: Formally recognize the California Statewide Interoperability Executive Committee's role in the administration of interoperability channels and the establishment of technical and operational policies for interoperability channels. The PSRSPC will collaborate with CALSIEC in defining these roles in 2007.

Task [timeframe]:

a) Work with the Administration and the Legislature to introduce a bill to include CalSIEC in Government Code. [2007-2008, but no later than August 2008]

1.2 Continue to bolster the confidence and participation of local, state, tribal, and federal public safety practitioners statewide by demonstrating consistent world-class leadership to the public safety community throughout California.

Task [timeframe]:

a) Initiate interoperability leadership conference. [2007]
b) Finalize governance infrastructures, including organizational charts with staff and meeting timeframes. [2007]
c) Continue interoperability outreach with various associations. [Ongoing]

PROJECTED OUTCOMES:

PSRSPC's stated goal is to lead in the effort of ensuring that ALL local, regional, state, and federal public safety agency first-responders operating within California will be able to communicate using compatible systems, in real time, across disciplines and jurisdictions, to respond more effectively during day-to-day operations and major emergency situations. This is only possible by exercising sustained, bold leadership while constantly collaborating with CALSIEC representatives on behalf of California's public safety community.

➢ Goal 2: Funding: Pursue a phased, renewable and priority-based funding strategy for California's public safety communications physical infrastructure and governance.

OBJECTIVES:

2.1 Obtain funding for immediate two-year critical operable equipment for the state agency's obsolete communication systems.

Task [timeframe]:

a) PSRSPC agencies detail their two year state critical operability communications systems-related funding requirements which need to be addressed immediately. [2007]
b) Within the next two-year interval (hopefully sooner rather than later), PSRSPC state agencies operating public safety radio systems obtain funding to mitigate critical communications system needs. [2007 – 2008]

c) Create a strategy to coordinate BCP generation that will meet both individual agency and collective needs. [1st quarter of 2007]

2.2: Develop a fiscal plan for obtaining legislative approval of on-going funding for critical communications governance, consistent coordination and collaboration, education, training and planning support of PSRSPC and CALSIEC activities.

Task [timeframe]:

a) Initiate and develop plan with PSRSPC & CALSIEC representatives. [2nd quarter of 2007]
b) Fiscal plan is endorsed. [Mid-2007]

2.3: Develop a long-term funding program to continue California's communication systems' operability and interoperability.

Task [timeframe]:

a) Interview participating agencies to validate functional and operational requirements. [2007]
b) Finalize criteria and document the needs analysis for each agency's communications systems. [2007]
c) Develop a Request for Information (RFI) to elicit industry's system solutions and costs. [2007]
d) Prepare a cost report. [2007]

2.4: Continue to pursue grant funding for limited-term interoperability equipment purchases or system upgrades throughout the state.

Task [timeframe]:

a) Identify future federal funding sources applicable to state agencies. [Ongoing]
b) Apply for federal grants to supplement equipment purchases. [Ongoing]

2.5: Participate in developing a streamlined procurement process.

Task [timeframe]:

a) Set up meetings with DGS Procurement to review current processes and propose process changes. [2007]
b) Prepare streamlined procurement process and present it to DGS Legal staff. [2007]
c) Set up meetings with DOF's Office of Technology Review, Oversight, and Security to establish feasibility study report waiver for the purchase of Digital Telecommunications Equipment (with data transfer capability). [2007]

PROJECTED OUTCOMES:

Necessarily aggressive goals for the modernization of California's public safety communications systems statewide were delineated earlier in this chapter. These goals can only be accomplished if infused with an adequate and consistent flow of funds. The central theme of these goals is to establish a funding environment conducive to moving forward.

A robust funding plan, which enables a rapid, efficient purchase of equipment through annual revenue sources comprised of:

- a reliable component (e.g., renewable funds)
- a fluctuating component (e.g., general funds), and
- an unpredictable, supplementary component (i.e., grants, bonds, etc.)

➢ Goal 3: Governance: Develop lasting and coordinated governance for integrated statewide public safety voice and data communication systems.

OBJECTIVES:

3.1: In coordination with CALSIEC, develop the California Statewide Communications Interoperability Plan (CALSCIP). Collaborate with CALSIEC in the development of functional and operational procedures that support a statewide standardized interoperable framework.

Task [timeframe]:

a) Meet with CALSIEC members, PSRSPC and Planning Areas to identify areas for seamless collaboration to develop the CALSCIP. [2007]
b) Assess local agencies survey information to assess interoperability capability. [2007]
c) Integrate existing Tactical Interoperable Communication Plans into the CALSCIP. [2007]
d) Develop the CALSCIP draft, incorporating existing interoperability communications plans, the federal plan criteria and the approved gateway unit governance documents. [2007]

3.2: In coordination with CALSIEC, facilitate the development of Tactical Interoperable Communications Plans (TICPs) among local jurisdictions across the state. Evaluate newly created Urban Area Security Initiative (UASI) TICPs to assist in this development.

Task [timeframe]:

a) Establish a California TICP template. [2007-2008]
b) Schedule and attend meetings with local and state agencies and CALSIEC members to collaborate on the development of regional TICPs. [2007-2008]
c) Track status of the Planning Area TICPs completion. [2007-2008]

3.3: Collaborate with CALSIEC in the creation of an interoperability MOU template (or templates) based upon practices statewide.

Task [timeframe]:

a) Identify communication interoperability terms of agreement - in accordance with mutual aid policy. [2007]
b) Schedule and attend meetings with stakeholders to verify agreement terms are suitable. [2007]
c) Verify terms are in accordance with the California Emergency Services Act and other applicable provisions of the law. [2007]
d) Initiate contact with bordering states (Oregon, Nevada, and Arizona) to determine communications interoperability needs and feasibility and to consider interoperability agreements. [2007]

3.4: Develop a training strategy and implement a long-term, continuous training program for stakeholders regarding the PSRSPC and CALSIEC and its processes.

Task [timeframe]:

a) Continue to enhance and augment an interoperable communications training program that is SEMS/NIMS compliant. [Ongoing]
b) Design an equipment training program for the various cache resources and telecommunications equipment available via mission tasking requests. [Ongoing]
c) Collaborate with CALSIEC on the development of a multi-discipline communications training program. [Ongoing]

PROJECTED OUTCOME(S):

To have a focus on new initiatives to maximize equipment use, improve interoperability, and address how California's responders prepare and practice for major emergencies. Stakeholder participation plays a crucial role in the planning, implementation, and revision of the statewide plan. In the effort to achieve interoperability collaborate with practitioners from multiple agencies and disciplines throughout California.

➢ Goal 4: Convergence: Focus technology research and "best practices" investigation through strong interagency coordination to enhance technology transfer and efficiency.

OBJECTIVES:

4.1: Continue to assess the equipment and procedural systems being used currently at both the state and local levels.

Task [timeframe]:

a) Evaluate the accuracy of data and follow up with agency respondents. [Ongoing]
b) Augment survey assessment where needed and compile data reports. [Ongoing]
c) Analyze local government agency systems and assess their potential role in a system of systems. [Ongoing]

4.2: Develop the "California System of Systems" (SoS) functional requirements to serve as criteria for both Requests for Information, as appropriate, and subsequent Requests for Proposals.

Task [timeframe]:

a) Continue defining/refining SoS functional and operational requirements documenting potential implied risks along the way. [2007]
b) Finalize functional and operational requirements for the transportable gateway project. [2007]

4.3: Continue to document and publish communication technology "best practices" and "lessons learned."

Task [timeframe]:

a) Gather data on gateway best practices to incorporate into gateway governance documents. [2007]
b) Review major event and exercise after action reports for communication technology issues and recommendations. [Ongoing]

PROJECTED OUTCOMES:

Mission area analysis efforts will determine the user's requirements, constraints, and initial strategy, followed by an approval for program initiation and authority to budget for a new program. Exhaustive research and functional analyses will result in correctly defining each agency's baseline of functions and functional performance requirements, which must be met to adequately accomplish the operation, support, test, and construction requirements of the ultimate SoS Project. Continuing cognizance of best practices and industry standards will help to ensure that any products the PSRSPC endorses/advances are achievable, effectively used, and in California's best interests.

➢ Goal 5: Technology: Outline realistic parameters of a "System of Systems" that could accommodate and build upon California's public safety communications network.

OBJECTIVES:

5.1: Establish the procedure for, and ensure accessibility through, strategic distribution of California's Interagency Communications Support Caches (CICSC), with an invitation for local participation. The cache would be available for use by public safety emergency personnel responding to disasters, in accordance with OES' mission tasking procedures.

Task [timeframe]:

a) Continue assessment and data review regarding cache equipment. [2007]
b) Establish an interagency procedure for sharing cache resources. [2007]

5.2: Continue defining systems' integration standards conducive to adoption by state and local agencies.

Task [timeframe]:

a) Further define system standards for state agency procurement. [2007]
b) Define procurement standards to ensure future P25 compliance statewide. [2007-2008]
c) Develop testing and training procedures. [2007-2008]

5.3: Continue the purchase and deployment process for transportable gateway units.

Task [timeframe]:

a) Compile "best practices" gateway information to prepare gateway governance documents (e.g. operating procedures, etc.) [2007-2008]
b) Proceed with gateway unit purchases, engineering and deployment. [2007]
c) Develop gateway unit training and exercise programs. [2007-2008]

5.4: Ensure that future acquisitions of equipment support standardized modernization and interoperable parameters.

Task [timeframe]:

a) Continue to research manufacturers' products for P-25 compliance and innovative components enhancing interoperability capabilities. [Ongoing]

PROJECTED OUTCOMES:

Any public safety guardian should be able to respond to any incident anywhere in California, using their own equipment, on any network, and on dedicated public safety spectrum. In addition, they will be able to communicate with each other as authorized via voice, data, and video on demand and in real time.

Chapter 4 - Legislatively Required Activities

The "Public Safety Communication Act of 2002" (Government Code Sections 8592-8592.7) identifies the responsibilities of the PSRSPC. The act was significantly amended in 2006 by SB 1132, and AB 1848, 2041, and 2116 (see Compendium of References, Appendix 5 for full statutory text). The sections below describe PSRSPC activities related to existing and newly enacted statutory requirements.

PSRSPC Membership and Meetings

AB 2041/2116, effective January 1, 2007, names the Office of Emergency Services as PSRSPC chair; adds the Military Department, Department of Health Services, and Department of Finance as members; and requires a minimum of two meetings annually, one of which will be a joint meeting with CALSIEC, to enhance coordination and cooperation.

While not required under statute in 2006, many activities took place that met the intent of AB 2041/2116. The Military Department and the California Department of Health Services have participated in PSRSPC and PSRSPC-TWG meetings and activities. The PSRSPC met quarterly in 2006, and the PSRSPC Technical Working Group met every three weeks, in order to achieve the 2006 annual report's goals and objectives.

Coordination between the PSRSPC and CALSIEC also occurred throughout the year. Representatives from several state agencies are members of both committees. Both committees included agenda items to discuss common issues and to update each other on current activities.

Model Memorandum of Understanding (MOU)

Government Code Section 8592.3 (c) tasks the PSRSPC to develop a model memorandum of understanding that sets forth general terms for interoperability or other shared uses among jurisdictions. PSRSPC –TWG members have been attending CALSIEC planning area meetings to facilitate the development of regional Tactical Interoperable Communications Plans (TICPs) that develop and/or document operational procedures and MOUs for regional interoperability. In accordance with a federal mandate, the regional TICPs will be used to aid in the formulation of the California's Statewide Communications Interoperability Plan (CALSCIP). The CALSCIP will provide an operations plan to maximize interoperability throughout the state. In coordination with CALSIEC, an MOU template will be developed based upon agreement practices statewide among all levels of government. This template will be able to be tailored to accommodate any contingencies.

Equipment

➢ Purchases

Government Code Section 8592.4 tasks the PSRSPC to (1) determine which state public safety departments need new or upgraded communication equipment, (2) establish a program for

equipment purchase, and (3) recommend the purchase of equipment that will enable state agencies to commence conforming to industry and governmental standards for interoperability.

Government Code 8592, et seq, requires state government entities who sit on the PSRSPC to purchase "TIA-102/APCO-25" compliant equipment to help realize the eventual goal of interoperability. However, many aspects of those standards remain in the development and approval stages. One series of procurements, near the end of fiscal year 2005/06, fell victim to this evolving standards process. Equipment purchase specifications prepared by the Department of General Services called out for the latest approved version of equipment approved by the "APCO-25" process; however, no manufacturer was able to deliver products within the timeline of the procurement. To ease situations such as this, the PSRSPC adopted a policy to allow the Department of General Services to first ascertain the market's ability to in fact deliver products within the timeline of the purchase before incorporating those details into the purchase specifications (see Compendium of References, Appendix 6).

➢ Waivers

Government Code Section 8592.5 (a) requires that state department public safety radio communication purchases comply with common system standards for digital public safety radio communications and with operational and functional requirements identified by the SAFECOM Program (U.S. Department of Homeland Security). Waivers granted to state agencies by the PSRSPC, relative to this statute, must be listed in the annual report to the Legislature.

There were no requests for waivers submitted to the PSRSPC in 2006. The situation described in the previous section ("Purchases") was handled by the adoption of a resolution by the PSRSPC rather than through the granting of a formal equipment purchase waiver.

➢ Budget Proposals

SB 1132 (effective on July 7, 2006) added Section 8592.7 to the Government Code. This section addresses state agency budget proposals for new or modified radio systems and requires those proposals be accompanied by a technical project plan. The technical project plan must include project scope, alternatives considered, solution justification, implementation plan, proposed timeline, and estimated costs by fiscal year. The PSRSPC is required to review the technical project plans for consistency with the state's strategic plan. DGS-TD is required to review the plans for technical consistency with the state's strategic plan.

The PSRSPC-TWG has developed an initial review protocol and is in the process of developing comprehensive procedures relative to these requirements. The procedures address the process for the PSRSPC to review state agencies' submitted project plans, as it relates to DGS' review and approval process.

Annual Report as State's Strategic Plan

The 2006 and 2007 PSRSPC Annual Reports to the Legislature have served as the strategic plan for statewide integrated public safety communications. Effective January 1, 2007, AB 1848 codifies the PSRSPC's annual report as the state's strategic plan and requires that the report contain, at a minimum, implementation strategies and timelines to achieve the identified goals and objectives. The report may also include identification of resource needs, including data formats,

possible funding sources, prioritization of expenditures, and the development of common protocols that build upon industry and governmental standards for interoperability that will advance the integration of local, regional, and statewide interoperable public safety communication networks. The report may include recommendations for local, regional, state, or federal entities to coordinate resources and the development of common protocols to advance the integration of local, regional, and statewide interoperable public safety communication networks.

The PSRSPC will work in coordination with CALSIEC and other interested stakeholders to refine and enhance the annual report process and content to fully meet the amended statutory language.

Chapter 5 - Conclusion

In 2006, the PSRSPC assessed the current state of California's public safety communications systems. Far from attaining interoperability, state agencies are struggling to remain operable and are restricted to using obsolete equipment as they carry out their public safety functions. Lack of funding is severely impacting the state's responders today. For state agencies, an infusion of an estimated $85 million is needed over the next two years for equipment alone. As the PSRSPC agencies focus on a plan to modernize the state's public safety communications infrastructure, those agencies must receive initial support and funding equivalent to 20 staff for each of the next two years (the needed PYs will be identified by each participating PSRSPC agency). The strategic initiatives proposed in this report cannot be accomplished by the constant redirection of staff away from other public safety activities.

Achieving a fully functioning interoperable communications system in California will realistically take over ten years. However, many critical goals and objectives must be accomplished over the next one to five years to meet state and federal mandates and to keep California on track for interoperability. The goals and objectives are based on the national model for interoperability and focus on leadership, funding, governance, system convergence, and technology.

Assuming adequate support, it is the intent of the PSRSPC to focus on the following areas in 2007:

- Address state agencies' two-year critical operability communications equipment needs through a coordinated budget approval process.
- Explore a streamlined state procurement process for communications equipment.
- Address the need for 20 limited-term staff to support state agency communications governance activities through the coordinated budget approval process.
- Determine a sustained funding method for California's communications systems.
- Strengthen collaboration with local, state, tribal, and federal public safety partners to include formal recognition of CALSIEC's role in interoperability.
- Prepare a cost report for the System of Systems based on functional and operational requirements and industry solutions.
- In coordination with CALSIEC's local/regional planning activities, develop the California Statewide Communications Interoperability Plan (CALSCIP) and interoperability MOU templates.
- In coordination with CALSIEC, initiate development of a multi-discipline interoperable communications training program.
- Proceed with mobile gateway purchase and deployment, governance documents, and user training.

California has developed and maintained an integrated multi-discipline, multi-agency emergency management system that is emulated by the nation. In order for this system to succeed, the state's public safety responders—local, state, tribal, and federal—must be able to communicate with each other using an interoperable communications system. The system components are more than pieces of equipment. To be successful, the system must be supported by an organizational structure, standard operating procedures, and training and exercises. And, as with any successful business venture, the system must have reliable funding to remain viable.

Attachments

Attachment 1 - Status of 2006 Strategic Action Plan

The PSRSPC made significant strides in addressing the initiatives identified in the 2006 Strategic Action Plan. Below is an overview of the committee's accomplishments.

➢ Initiative 1: Focus technology research and "best practices" investigation through strong interagency coordination to avoid duplication and enhance technology transfer.

***Goal 1.1*: Assess the equipment and procedural systems being used currently at both the state and local level.**

- PSRSPC, in collaboration with CALSIEC, conducted a statewide Internet-based survey to address radio systems and to analyze their interoperability. The survey resulted in recommendations relative to immediate operability; validation of specific information to support development of the System of Systems; and the criticality of funding and support to carry out future assessments and information validation required for operability and interoperability activities.

***Goal 1.2*: Develop a "California Statement of Requirements" (SoR) for the next generation state communications network, to serve as criteria for a Request for Proposal.**

- The PSRSPC developed a preliminary high-level California SoR for the System of Systems which includes 41 broadly defined system capabilities criteria harmonious with the SAFECOM Program ideology.

***Goal 1.3*: Convene a "Demonstration Day" for equipment vendors to demonstrate their products to the state agency representatives.**

- The PSRSPC conducted an exploratory market survey and held a demonstration day for large scale public safety wireless voice and data communications systems integrators in May 2006. Seven integrators demonstrated how their system solutions could accommodate California's high-level Statement of Requirements, take into consideration communications trends from the PSRSPC's 2006 report to the Legislature, and allow the state to leverage their existing systems while moving towards interoperability. Several approaches were identified that meet California's SoR.

***Goal 1.4*: Document and publish "best practices" identified during the investigative phases of this initiative.**

- The System of Systems Capabilities Criteria is posted on the PSRSPC website, along with informational links providing guidance and best practices.

➢ Initiative 2: Investigate realistic parameters of a "System of Systems" that could accommodate & build upon California's public safety communications network

Goal 2.1: **Initiate the development of a comprehensive *California Interagency Communications Support Cache (CICSC)* for use by public safety emergency personnel responding to disasters.**

- The PSRSPC survey (see Goal 1.1) gathered information that will support the development of a CICSC.

Goa1 2.2**: Achieve maximum interoperability across existing statewide systems.**

- The PSRSPC survey (see Goal 1.1) gathered initial information about the status of the state's "gateway" bridging systems.
- OES and DGS have been defining the design elements of mobile gateway units.
- Based on the number of gateway communication devices available throughout the state and limited FY 06 Federal Homeland Security Grant Program funds, six mobile gateways will be procured and hosted within the regions for deployment through the mission tasking process on an "as needed basis."

Goal 2.3**: Pursue future acquisitions of equipment that support standardized modernization and interoperable parameters, and a streamlined procurement process that recognizes standards-compliant contracts at multiple levels of government.**

- The PSRSPC-TWG has developed draft operational procedures consistent with the requirements of Government Code Sections 8592.4, 8592.5 (a), and 8592.7. The procedures address the process for the PSRSPC to review state agencies submitted project plans, as it relates to DGS' review and approval process.

Goal 2.4: **Design and implement operational procedures that support a statewide standardized, interoperable framework.**

- As an initial step in developing the SoS, the PSRSPC conducted an exploratory market survey of large scale public safety wireless voice and data communications systems integrators in May 2006. The goal of the survey was to help in formulating the SoS functional requirements. Based on information received, development of a preliminary draft of the System of Systems PSRSPC Project Plan – Phase I was initiated.
- A high-level procurement strategy was developed.

➢ Initiative 3: Pursue a phased, renewable, and priority-based funding strategy for California's public safety communications physical infrastructure and governance.

Goal 3.1**: Secure stop-gap funding for critical governance, consistent coordination, and planning support of PSRSPC and CALSIEC.**

- The PSRSPC-TWG developed funding needs to address state agency support to carry out the statutory duties for PSRSPC and to ensure continued coordination with CALSIEC.

***Goal 3.2*: Secure stop-gap, immediate funding to support critical needs of existing state agency systems, in order to maintain current communications systems requirements.**

- The needs analysis and assessment conducted in 2006 identified critical state agency system needs. Based on this assessment and additional information provided by the PSRSPC agencies that operate radio systems, the PSRSPC-TWG identified funding needs to address current communications systems requirements.

***Goal 3.3:* Maximize direct funding and "in-kind" support of federal government in pursuit of state and local system modernization and interoperability.**

- A request by OES for Homeland Security Grant Program funds was approved for $5,000,000 to address interoperable communications.
- Local governments and state agencies were routinely advised of the availability and requirements of federal grant programs. Information was shared at meetings, through letters and e-mails, and through the PSRSPC and CALSIEC websites.

➢ Initiative 4: Develop lasting and coordinated governance for integrated statewide public safety voice and data communication systems that incorporates both existing and new organizational efforts.

***Goal 4.1*: Coordinate the complimentary work of the PSRSPC and CALSIEC**

- Coordination between the PSRSPC and CALSIEC occurred throughout the year. Several state agencies are members of both committees. Both committees included agenda items to discuss common issues and to update each other on current activities.
- Created draft CALSIEC Governance document (June 15, 2006).
- PSRSPC and CALSIEC will work collaboratively to ensure a joint meeting is held in 2007 as required effective January 1, 2007 pursuant to Government Code 8592.2 (c).

***Goal 4.2:* Develop strong support and involvement from all PSRSPC stakeholders.**

- Routine meetings of the PSRSPC and PSRSPC-TWG were held.
- PSRSPC member agencies led and participated in work teams established by the PSRSPC-TWG to address 2006 strategic goals. Work team activities and products were conducted and shared with stakeholders. Work teams established were:
  - Assessing System Capabilities/Needs Analysis
  - System of Systems (previously two work groups - Statement of Requirements and Vendor Demonstration)
  - Governance/Memorandum of Understanding
  - Spectrum
  - Gateway
  - Fiscal
  - CALSIEC-PSRSPC Coordination

***Goal 4.3*: Convene and support a Working Group to coordinate the use of state agency spectrum holdings.**

- The PSRSPC-TWG Spectrum Work Team, established in 2006, explored national issues as they relate to California, including narrowbanding below 512MHz, wireless broadband, 700MHz advocacy, and border issues.
- Spectrum topics have been included in CALSIEC Executive and Planning Area meetings.

***Goal 4.4*: Design a long-term, continuous education strategy for new state agency appointees regarding the PSRSPC and its processes.**

- The PSRSPC-TWG developed an educational package for PSRSPC members and executives titled "California Interoperability: Introductory Information."

Attachment 2 - Summary of Interviews with Other States

➢ Commonwealth of Virginia

Virginia (VA) has established the Commonwealth Interoperability Coordinator (CIC) in the Commonwealth Interoperability Coordinator's Office (CICO) which reports to the Governor's Office of Commonwealth Preparedness.

The Virginia project started with SAFECOM in 2004. There were six regional focus groups that conducted strategic planning sessions. There are now 14 entities representing local and state public safety associations and government on the State Interoperability Executive Committee (SIEC). In addition, the VA SIEC is involved with the review and recommendation of grant proposals. Since 2004 VA has spent $11.243 million of which $9.164 million goes to local government for voice and data interoperability.

VA recommends that a full time position dedicated as the Interoperability Coordinator is needed to effectively lead an interoperability project. VA's CIC position and one staff member are built into the Governor's budget. The CICO also has an intern and four consultants working fulltime on the project. The consultants' work focuses on implementation of initiatives identified by first responders. To date, their work has been paid for by grant funds and earmarks; however, the funding is needed on an annual basis.

In SAFECOM's report, *Lessons Learned from the Commonwealth of Virginia: One Year Later*, the following lesson, relating to the leadership governance structure, was recorded:

> Lesson 4: Centralizing Coordination of the Effort
> Establishing and naming a body to coordinate an effort of this magnitude is essential. Practitioner committees offer guidance and expertise; however, due to already full schedules, they may not offer the coordination needed to ensure plan implementation. A designated, full-time coordinator or coordinating body is an investment that can significantly enhance project success. Recommendations – Establish centralized, non-practitioner coordination: Emphasize the need for a paid coordinator or coordinating body to centrally organize interoperability efforts.
>
> Results: Virginia established the Commonwealth Interoperability Coordinator's Office (CICO) to coordinate planning and implementation. This created a forum to continue state-wide collaboration and identified a person designated to plan implementation.

➢ State of New York

The New York Statewide Wireless Network (SWN) is a mission-critical project for public safety which is moving the state from obsolete and failing architecture to a state-of-the-art digital trunked land mobile radio system. The Office for Technology is managing the procurement and overseeing the prime contractor's design, construction, and operation of SWN through a dedicated staff in the SWN project office. Additional guidance for network development and operation is provided by the SWN Advisory Council which is chaired by the Chief Information Officer of the state.

The SWN will serve all state agencies and enhance local initiatives by fostering partnerships with local emergency first responders and service providers on a voluntary basis. The initial installation will accommodate up to 65,000 users and 25,000 separate "talk groups" at any give time, statewide, and it will support up to 250,000 individual pieces of user equipment. There are three basic levels of local government participation (partnerships) on the SWN with different costs to users listed below. Both local agencies and the state mutually benefit through sharing infrastructure and frequencies, thereby reducing costs for all.

- Level 1 - Sharing of infrastructure to reduce cost and environmental impact – No cost
- Level 2 – Includes Level 1 and provides interoperability with SWN through a network gateway to an existing local government radio system - Minimal associated costs for gateway installation
- Level 3 - Full SWN participation – Includes Level 1 and locals required to purchase subscriber radios to operate on SWN. Also allows for local enhancements to SWN for increased coverage.

Funding for the SWN comes primarily from the State Wireless Communications Service Surcharge. The 20-year price for the SWN Contract is a not-to-exceed price of $2 billion. This total encompasses network development costs (e.g., design and construction of infrastructure, network equipment, financing, etc.) and all costs for network operations and maintenance over the 20 year term of the contract, including training.

➢ State of Indiana

The Indiana SAFE-T (Safety Acting for Everyone - Together) Project is a statewide, interoperable, wireless public safety communications system for local, state, and federal first responders/public safety officials. The project is overseen by the Integrated Public Safety Commission (IPSC) and its 10 staff. The IPSC is a statutory body with 12 members representing law enforcement, fire, city, and county government; private industry; and the Indiana Senate and House of Representatives.

Project SAFE-T began in 1997. The Indiana State Police had received funds from the legislature to upgrade their system. However, the State Police understood that other state agencies and local governments also needed new systems. The state hosted Governor's summits to get input from their partners. Instead of connecting regional systems, the state's goal was to build an interoperable system statewide.

Indiana's SAFE-T operates on an 800 MHz trunked voice and data system. It supports both analog and digital radios, providing 95% mobile radio coverage statewide using 126 communications sites connected by T1 lines and microwave. All construction is scheduled to be completed by March 2007. Coverage testing and final system acceptance is scheduled to be completed in June 2007.

SAFE-T has approximately 38,000 potential system users. There will be a total of 135 to 140 communication sites—127 state-owned sites augmented by sites added by counties. With one exception, the state has been able to utilize existing government communication sites or to lease sites from the private sector. There are no subscriber fees for system users who buy their own portable/mobile radios and console equipment. The state negotiated discounts for radios and local

government can use the negotiated agreement to purchase radios/consoles. The state opened a Network Operations Center last year to provide support to subscribers.

Indiana has a “not-to-exceed” $90 million contract to build the system. As a sustainable funding source, the IPSC receives $1.25 out of each service fee collected on certain Bureau of Motor Vehicles transactions. This funding source is designated through 2019. The IPSC anticipates using future funds for system upgrades.

Attachment 3 - Definitions & Acronyms

A	
ACU-1000	A model of an interoperability gateway unit
ANSI	American National Standards Institute
APCO	The Association of Public-Safety Communications Officials, International

B	
Band	A common reference to a segment of the radio spectrum.
Bandwidth	The amount of spectrum occupied by a radio signal (usually measured in kiloHertz). There is an ongoing effort nationally to increase the amount of usable spectrum by reducing the bandwidth ('wideband') used today in half ('narrowband'), and adding new users in between the existing users.
BCP	Budget Change Proposal
Broadband	In the context of public safety communications, a data transmission where the bandwidth is more that 1.0 MHz. These data transmissions include image files (fingerprint images, photos of a missing person, video from an incident, or maps of buildings) and large text files such as reports.

C	
CAD	Computer-Aided Dispatch
CALSIEC	California Statewide Interoperability Executive Committee
CalTrans	California Department of Transportation
CDCR	California Department of Corrections and Rehabilitation
CDF	California Department of Forestry and Fire Protection
CDHS	California Department of Health Services
CFR	Code of Federal Regulations
CHP	California Highway Patrol
CICSC	California Interagency Communications Support Cache
CYA	California Youth Authority. The CYA was abolished on July 1, 2005 and the functions of the department combined into the California Department of Corrections and Rehabilitation (CDCR).

D	
DFG	Department of Fish and Game
DGS-TD	Department of General Services, Telecommunications Division
DHS	U.S. Department of Homeland Security
DOF	Department of Finance
DOJ	Department of Justice
DPR	Department of Parks and Recreations
DWR	Department of Water Resources

E

EMS	Emergency Medical Services
EMSA	California Emergency Medical Services Authority

F

FCC	Federal Communications Commission. The FCC is the regulatory agency for non-federal users of the radio spectrum (including broadcasters, state and local government, utilities, and private individuals).
FIRESCOPE	FIrefighting RESources of California Organized for Potential Emergencies. The FIRESCOPE program is a continuation of a congressionally established project following the 1970 wildland fire season to improve multi-agency coordination during emergency operations. Incident Command Systems and Multi-Agency Coordination Systems were developed by the FIRESCOPE project.

Frequency Bands

Reference Name	**Frequency Band**	**Characteristics, State Users, Notes**
High Frequency	2 – 25 MHz	"Long haul" disaster communications. Used by CDF, CalTrans, and OES for intra-state and inter-state coordination. *Not subject to FCC's "Reframing" initiatives or digital radio standards.*
VHF	30 – 50 MHz	Good for penetration in hilly or open areas, but not into buildings or for hand-held radios. Local activities are frequently interfered with by out-of-area operations ("skip"). Used by CDCR, CDF, CHP, CalTrans, and OES. *Not subject to FCC's "Reframing" initiatives or digital radio standards.*
"VHF – Mid Band"	72 – 76 MHz	Fixed (point – to – point) links. Used by CHP *Not subject to FCC's "Reframing" initiatives or digital radio standards.*
"VHF – Hi Band"	136 – 174 MHz	Mixed Federal / non-Federal spectrum 136 – 150 MHz Military [NTIA-controlled] 150 – 162 MHz non-Federal [FCC-controlled] 162 – 174 MHz Federal [NTIA-controlled] Widely used band in state and Federal systems. Offers good coverage in hilly terrain and in urban areas. Signals are generally not affected by dense foliage, but poor penetration into steel and masonry buildings. Used by CDCR, CDF, CHP, DFG, DGS, DOJ, DPR, DWR, and OES. *Subject to FCC's "Reframing" initiatives*
"220 MHz Band"	220 – 222 MHz	Predominately for industrial users, but some public safety allocations. Lightly used in California, mostly by local agencies for non life-safety applications (e.g. public works). *Not subject to FCC's "reframing" initiatives or digital radio standards.*

"406 MHz Band"	406 – 420 MHz	Federal spectrum, NTIA-controlled; used by state departments (CDF, OES, EMSA) who are cooperators with Federal users (USFS, DHS, HHS). NTIA has mandated narrow bandwidths starting 01/01/2005
"UHF Band"	450 – 470 MHz	Non-Federal spectrum. Shares many of the aspects of VHF-Highband; better building penetration, in exchange for less range on signals. Used by CDCR, CHP, numerous small departments, OES *Subject to FCC's "Refarming" initiatives*
"UHF – TV Band"	470 – 512 MHz	Television Broadcast spectrum (Channels 14 – 20) reallocated to Public Safety and industrial services in 13 largest metropolitan areas of U.S. Characteristics same as UHF band. Channels 14, 16, and 20 in Los Angeles area Used by Los Angeles County and majority of cities for Law Enforcement operations Channels 16 and 17 in San Francisco Bay area. Used by local systems in Marin, San Mateo, and Santa Clara counties *Subject to FCC's "Refarming" initiatives*
"700 MHz Band"	764 – 776 MHz 794 – 806 MHz	New band (established 1998) for Public Safety, reallocated from Television Broadcast. Provides shorter range than UHF bands, excellent penetration into some building materials, very poor penetration into other building materials. Requires more infrastructure (fixed sites) to provide coverage over a given area compared to VHF-High or UHF bands. Does not cover well in dense foliage. Voice and data allocations Portion allocated exclusively to States Portion allocated exclusively to Interoperability Not available in most areas of California until incumbent TV stations relocate (This date is uncertain. Current legislation in Congress proposes April 7, 2009) *All operations must use new digital technologies.*
"800 MHz Band"	806 – 821 MHz 851 – 866 MHz	Mixed Industrial, Cellular-like (Nextel), and Public Safety systems. Provides shorter range than UHF bands, excellent penetration into some building materials, very poor penetration into other building materials. Requires additional infrastructure (fixed sites) to provide coverage over a given area compared to VHF-High or UHF bands. Does not cover well in dense foliage. Used by CalTrans, CDCR, DGS, DPR, Legislature, and OES *While not subject to the "Refarming" initiatives or the digital radio standards, the "800" and "NPSPAC" bands are under an FCC-mandated realignment plan to correct interference issues. This is being handled in four 'waves' nationally; the 48 northern-most counties in California are in Wave 1, and the 10 southern-most counties in California are in Wave 4. This transition will take place in the 2006-2008 time frame.*

"NPSPAC Band"	821 – 824 MHz 866 – 869 MHz	Public Safety exclusive band, same coverage as 700 MHz and 800 MHz. Used by CalTrans, CDCR, DGS, DPR, and OES *While not subject to the "Refarming" initiatives or the digital radio standards, the "800" and "NPSPAC" bands are under an FCC-mandated realignment plan to correct interference issues. This is being handled in four 'waves' nationally; the 48 northern-most counties in California are in Wave 1, and the 10 southern-most counties in California are in Wave 4. This transition will take place in the 2006-2008 time frame.*
"4.9 GHz Band"	4940 – 4990 MHz	New band (established in 2003) for Public Safety wireless data ("Wi-Fi") applications. Low power, small coverage areas (< ¾ mile), share data among PCs, PDAs, etc..

G

Gateway	The commonly accepted term to describe a standalone device that is used to patch two or more radio systems together to bridge the users of each system, creating interoperability.
GHz	Gigahertz Unit of frequency measurement, in thousands of Megahertz (or one billion Hertz). 4.9 GHz is equal to 4,900 MHz.

H

Hi-Band	Common name for the 136-174 MHz portion of the VHF radio spectrum,
Hz	Hertz, The accepted unit of measurement for audio and radio frequencies. One Hertz is equal to one cycle per second.

I

ICS	Incident Command System
ICTAP	Interoperable Communications Technical Assistance Program of DHS.
Interoperability	Interoperability generally refers to the ability of public safety emergency responders to work seamlessly with other systems or products without any special effort. Wireless communications interoperability specifically refers to the ability of public safety officials to share information via voice and data signals on demand, in real time, when needed and as authorized. For example, when communications systems are interoperable, police and firefighters responding to a routine incident can talk to each other to coordinate efforts. Communications interoperability also makes it possible for public safety agencies responding to catastrophic accidents or disasters to work effectively together. Finally, it allows public safety personnel to maximize resources in planning for major predictable events such as the Super Bowl, or an inauguration, or for disaster relief and recovery efforts. As defined by the Department of Homeland Security's SAFECOM Program. See http://www.safecomeprogram.gov/SAFCOM/interoperability/default.htm
IPSC	Integrated Public Safety Commission [Indiana]

K	
kHz	kiloHertz. Unit of frequency measurement, in thousands of Hertz (7.5 kHz equals 7,500 hertz).

L	
LARTCS	Los Angeles Regional Tactical Communications System
LMR	Land mobile radio
Low-Band	Common name for the 30-50 MHz portion of the VHF radio spectrum.

M	
MACS	Multi-Agency Coordination System. A component of the Standardized Emergency Management System, MACS is a governance process used to prioritize the allocation of response resources during times of multiple incidents occurring simultaneously.
MHz	MegaHertz. Unit of frequency measurement, in millions of Hertz (1.0 MHz is equal to 1,000 kHz).
Mid-Band	Common name for the 72-76 MHz portion of the VHF radio spectrum.
MOU	Memorandum of Understanding

N	
Narrowband	In the context of current voice and slow-speed data signals, a signal that occupies less than 12 kHz of bandwidth.
NASTD	National Association of State Telecommunications Directors
NCC	Public Safety National Coordination Committee.
NIJ	National Institute of Justice
NIMS	National Incident Management System
NPSPAC	National Public Safety Planning Advisory Committee The NPSPAC was a federal advisory committee to the FCC, chartered in the late 1980s to develop the rules for the 821-824 / 866-869 MHz public safety sub-band (now known as the "NPSPAC Channels").
NRP	National Response Plan
NTIA	National Telecommunications and Information Administration in the U.S. Department of Commerce. NTIA is the regulatory agency for federal users of the radio spectrum.

O	
ODP	Office of Domestic Programs in DHS
OES	California Governor's Office of Emergency Services
OHS	California Office of Homeland Security
Operability	The ability for members of a public safety agency to communicate as authorized with other members of that agency at any time from anywhere within the agency's responsibility area.

P	
P25	Project 25. Project 25 is a set of standards produced by the joint efforts of APCO, NTIA, and NASTD under Telecommunications Industry Association (TIA) governance.
PRISM	Public-safety Radio Integrated Systems Management project. The working title of the PSRSPC effort prior to 2000.
PSRSPC	Public Safety Radio Strategic Planning Committee
PSRSPC-TWG	Public Safety Radio Strategic Planning Committee Technical Working Group
PSWAC	Public Safety Wireless Advisory Committee
PSWN	Public Safety Wireless Network
PY	Personnel year

R	
RFI	Request for Information
RFP	Request for Proposal
RMS	Record Management System
RPC	Regional Planning Committee. The FCC has established 55 Planning Regions in the US and possessions to address local management and planning of new public safety radio spectrum

S	
SAFECOM	The SAFECOM Program in DHS' Office for Interoperability and Compatibility provides research, development, testing and evaluation, guidance, and assistance for local, tribal, state, and federal public safety agencies working to improve public safety response through more effective and efficient interoperable wireless communications.
SAFE-T	Safety Acting for Everyone – Together [Indiana]
SCIP	Statewide Communications Interoperability Plan
SEMP	Systems Engineering Management Plan
SEMS	Standardized Emergency Management System
SIEC	Statewide Interoperability Executive Committee
SoR	Statement of Requirements
SoS	System of Systems. The result of the amalgamation of disparate communications systems statewide via digital networking technologies into a linked infrastructure (or network) capable of supporting interoperable communications.
SWN	Statewide Wireless Network [State of New York]
SWP	State Water Project

T	
TIA	Telecommunications Industry Association
TICP	Tactical Interoperable Communication Plan
Trunking	Trunking is a technology used to increase the efficiency of a radio system by distributing conversations over a pool of radio channels, as needed.

U	
UASI	Urban Area Security Initiative. A program of DHS covering the 50 largest urban areas in the United States, to provide additional funding for Homeland Security efforts. There are 10 UASI cities in California.
UHF	Ultra High Frequency. 1. Common name for the radio spectrum between 300 and 3,000 MHz. 2. Common designator for the segment of the band between 450 and 470 MHz used for two-way radio (including public safety).
UHF-T Band	Common name for the segment of the UHF band between 470 and 512 MHz. Nationally, UHF T-Band is allocated to television broadcast, but redirected to two-way radio use (including public safety) in the Los Angeles and San Francisco areas.

V	
VHF	Very High Frequency. A common name for the radio spectrum between 30 and 300 MHz.
VHF-Hi	Common designator for the segment of the band between 136 and 174 MHz used for two-way radio (including public safety).
VHF-Lo	Common designator for the segment of the band between 30 and 50 MHz used for two-way radio (including public safety).

W	
Wideband	1. In the context of current voice and slow-speed data signals, a signal that occupies between 16 and 25 kHz of bandwidth. 2. In the context of the future 700 MHz public safety band, data signals with a bandwidth less than 1.0 MHz.

Public Safety Radio

Strategic Planning Committee:

2007 Statewide Integrated Public Safety Communications Strategic Plan

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A plan for California State public safety communications system integration, modernization, and interoperability

COMPENDIUM OF REFERENCES

TO REPORT TO THE CALIFORNIA STATE LEGISLATURE

as required by Government Code §8592.6

January 1, 2007

Governor
Arnold Schwarzenegger

PSRSPC Chair
Henry R. Renteria
Director, Governor's Office of Emergency Services

COMPENDIUM OF REFERENCES

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Appendix 1 - 2006 Online Assessment Survey

This survey may also be accessed via the PSRSPC Website (2006 Online Assessment Survey).

YOUR USER No.:
Your Survey Status:

1. Commenter Information

Comment Date: Reference Number:

First Name: _____
Last Name: _____
Address: _____
City: _____
Zip Code: _____

Email Address: _____
Phone Number: _____
County:

__ State	__ Agency	__ Alameda	__ Alpine
__ Amador	__ Butte	__ Calaveras	__ Colusa
__ Contra Costa	__ Del Norte	__ El Dorado	__ Fresno
__ Glenn	__ Humboldt	__ Imperial	__ Inyo
__ Kern	__ Kings	__ Lake	__ Los Angeles
__ Lassen	__ Madera	__ Marin	__ Mariposa
__ Mendocino	__ Merced	__ Modoc	__ Mono
__ Monterey	__ Napa	__ Nevada	__ Orange
__ Placer	__ Plumas	__ Riverside	__ Sacramento
__ San Benito	__ San Bernardino	__ San Diego	__ San Francisco
__ San Joaquin	__ San Luis Obispo	__ San Mateo	__ Santa Barbara
__ Santa Clara	__ Santa Cruz	__ Shasta	__ Sierra
__ Siskiyou	__ Solano	__ Sonoma	__ Stanislaus
__ Sutter	__ Tehama	__ Trinity	__ Tulare
__ Tuolumne	__ Ventura	__ Yolo	__ Yuba

Identify Primary Mutual Aid Region: 1, 2, 3, 4, 5, 6
Type of Commenter (Check Only One): Contractor, fed agency, local gov, non profit, state agency
Commenter's Agency/Business:
Agency Represented:
Secondary Contact Information:
First Name: _____
Last Name: _____
Phone Number: _____
Email Address: _____

2. Jurisdiction Overview and Agency Mission

Level of Government (Operator):
__ State
__ Regional (More than one county, may include JPA)
__ County
__ City
__ Special district
__ Local interagency (within one county, may include JPA)
__ Federal

Disciplines Served:
__ Law Enforcement
__ Fire and Rescue
__ Emergency Medical Services – Fire
__ Emergency Medical Services – non fire
__ Incident Response
__ Private Security
__ Operational field staff (public works, building inspection, utilities etc.
__ Administrative (including radio systems staff use)
System Name:
Geographic Service Area
Included in a Tactical Interoperable Communication Plan? Yes No

3. Agency Operational and Radio System Overview

Number of radio system users:
__ 1-100
__ 100-250
__ 250-500
__ 500-1000
__ 1000-2000
__ 2000-5000
__ 5000-10000
__ 10000-15000

System Communicates with:
__ Your agency only
__ Your agency only-statewide
__ Some allied agencies in your county
__ All agencies in your county
__ Allied agencies in a region including more than one county
__ Allied agencies statewide

Are you a part of a shared system? _____Yes _____No

Name shared system (i.e. san Diego RCS, EBRCS, etc.)
Are you currently upgrading your system?
__ Planning
__ Procuring
__ Implementing
__ No current upgrade activities

4. System Radio Frequencies

Frequency bands used: (check all that apply)
__ HF __ VHF-Hi __ UHF __ 700 __ WHF-Lo __ 220 __ UHF-T __ 800

Do you use:
__ Local License Frequencies
__ State/Federal Interoperability Frequencies
__ Federal Frequencies (NSTI)
__ Military Frequencies
__ Amateur Radio

System Configuration
Trunked Signal Type: __ Analog __ Digital
Trunked Proprietary System: __ Motorola __ LTR __ EDACS __ N/A
Conventional Signal Type: __ Yes __ No
Conventioanl not used
__ Analog channel spacing wide
__ Analog channel spacing narrowband
__ Digital

Do you operate a mixed trunked /conventional system? __ Yes __ No
What percentage trunked? _____

5. Agency Radio Facilities and Equipment - How Many:

Fixed Stations	**Total**	**# of Obsolete/Failing**
Mobile Relay:	_____	_____
Base Station:	_____	_____
Control Station:	_____	_____
Mobile Radios:	_____	_____
Portable (hand held):	_____	_____
Mobile Data Terminals:	_____	_____
Satellite Telephone:	_____	_____
Number of Mobile:	_____	_____
Number of Portable (hand held):	_____	_____
Number of Fixed:		
Satellite Dispatch Radio	_____	_____
Number of Mobile:	_____	_____
Number of Portable (hand held):	_____	_____
Number of Fixed:	_____	_____

Satellite Data Terminal

Number of Mobile:	_____	_____
Number of Fixed:	_____	_____

6. Survivable Communications Systems (Cache/Reserve)

	Total	# of Obsolete/Failing
Hand Held Radios:	_____	_____
Cellular Telephones:	_____	_____
Portable/Mobile Repeaters:	_____	_____
Gateways (i.e. ACU):	_____	_____
Mobile Communications Unit:	_____	_____
Satellite Telephone:	_____	_____
Satellite Dispatch Radio	_____	_____
Satellite Data Terminal:	_____	_____

7. Audio Gateway Systems (i.e. ACU)

Do you operate gateway(s)	_____Yes	_____ No
Number of Mobile:	_____	
Number of Transportable:	_____	
Number of Fixed:	_____	
Geographic Area Served:	_____	
Is/are your gateway(s) available for mutual aid use?	_____Yes	_____ No
Interagency Governance Plan?	_____Yes	_____ No

Operated Frequencies: (Check all that apply)

__HF __VHF-Hi __UHF __700
__VHF-Lo __220 __UHF-T __800

Are your frequencies included in other agency gateways?	_____Yes	_____ No
Number of Mobile:	_____	
Number of Transportable:	_____	
Number of Fixed:	_____	
Geographic Area Served:		
Interagency Governance Plan?	_____Yes	_____ No

Operated Frequencies: (Check all that apply)

__HF __VHF-Hi __UHF __700
__VHF-Lo __220 __UHF-T __800

Do you have access to a gateways operated by other agencies?	_____Yes	_____ No
Agencies/Jurisdictions		

Interagency Governance
Plan? _____Yes _____ No

8. Dispatch Operations

Do you operate dispatch
services? _____Yes _____ No
How many dispatch centers? _____

9. Advanced Capabilities

Please select all that apply:

__ VolP Transport of Radio Traffic (RolP)
__ Microwave System
__ Satellite Communications Systems (other than OES' OASIS)
__ Fixed Broadband Video/Data Capability
__ Mobile Broadband Video
__ Computer Aided Dispatch (CAD/Server)
__ Mobile Data Terminals/Computers (MTDs/MDCs)
__ Geographic Information Systems (GIS)
__ Automatic Vehicle Location (AVL)

Do you have Video Teleconferencing in your
Emergency Operations Center? _____Yes _____ No

10. Current Needs and Requirements of the Agency Radio System

Briefly identify communications challenges:

_____
_____
_____

Needs:

__ Additional Channels
__ Expanded System Coverage
__ Funding
__ Modernization
__ FCC Compliance
__ FCC Required Modernization

11. Future Directions and Initiatives for your System Develop plans for interoperability?

_____Yes _____ No

Explain:

_____
_____
_____

Attach Plan Here:
Attachments: to attach a file, push Browse and locate the file and press OPEN

Narrowband Transition Time Frame: _____
___ Funded ___ Unfunded
Project 25 Implementation Time Frame: _____
___ Funded ___ Unfunded

12. Interoperability Progress on Continuum (check one button per category) (Click View Continuum for Reference) View Continuum

Governance:
__ Individual Agencies Working Independately
__ Informal Coord. Between Agencies
__ Key Multidiscipline Staff Collaboration on a Regular Basis
__ Regional Committee Working with a Statewide Interop
__ Committee
Standard Operating Procedures:
__ Individual Agency SOPs
__ Joint SOPs for Planned Events
__ Joint SOPs for Emergencies
__ Regional Set of Communications SOPs
__ NIMS Integrated SOPs
Technology:
__ Swap Radios
__ Gateway
__ Shared Channels
__ Propriety Shared Systems
__ Standards-based Shared System
Training and Exercise:
__ General Orientation on Equipment
__ Single Agency Tabletop Exercises for field and support staff
__ Multiagency Tabletop Exercises for Field and Support Staff
__ Multiagency Full Functional Exercise Involving All Staff
__ Regular Comprehensive Regional Training and Exercises
Usage:
__ Planned Events
__ Localized Emergency Incidents
__ Regional Incident Management
__ Daily Use Throughout Region

13. Additional Comments about your System

Appendix 2 - Requirements Definition

Requirements Definition Goals & Objectives:

The evolving Statement of Requirements (SoR) must necessarily represent a comprehensive integrated public safety solution able to accommodate (to the greatest extent practicable) legacy, current, and future public safety wireless voice and data communications systems of those local, state, and federal government users having the wherewithal, willingness, and legitimacy to participate.

Remain ever cognizant of the SAFECOM Program mantra that states, "…to drive progress along the five elements of the continuum and improve interoperability, public safety practitioners should observe the following principles:

- Gain leadership commitment from all disciplines (Emergency Medical Services [EMS], Fire, Law Enforcement)].
- Foster collaboration across disciplines (EMS, Fire, Law Enforcement) through leadership support.
- Interface with policy makers to gain leadership commitment and resource support.
- Use interoperability solutions on a regular basis.
- Plan and budget for ongoing updates to systems, procedures, and documentation. and
- Ensure collaboration and coordination across all elements (Governance, Standard Operating Procedures [SOPs], Technology, Training/Exercises, Usage)."

To develop a System-of-Systems (SoS) based SoRs:

- Focused on the functional needs of public safety first responders—EMS personnel, firefighters, and law enforcement officers—to communicate and share information as authorized when it is needed, where it is needed, and in a mode or form that allows the practitioners to effectively use it. The communications mode may be voice, data, image, video, or multimedia that includes multiple forms of information.

- Rooted in the goal of improving the ability of public safety personnel to communicate among themselves, with the non-public safety agencies and organizations with whom they work, and with the public that they serve

To assist the telecommunication interoperability and information-sharing efforts by and among local, tribal, state, and federal government agencies, and regional entities, by delineating the critical operational functions and interfaces within public safety communications that would benefit from research and development investment and standardization.

Key Elements/Issues to be expanded upon:

- **Public Safety Requirements and Roles**, defines public safety communication needs and public safety roles and functions.

- **Communications Services Definition** defines communications services—interactive and non-interactive voice communications and interactive and non-interactive data communications.

- **Public Safety Wireless Communications Scenarios** outlines several public safety scenarios based on typical operations to provide a view of future public safety communications.

- **Operational Requirements of Public Safety for Wireless Communications and Information Capabilities** identifies the wireless communications operational needs of public safety.

- **Wireless Communications Functional Requirements** defines the wireless communications functional requirements.

- **Complete Glossary** of the terminology and acronyms used in the SoS-oriented SoR.

- **System Capabilities** including**:**

  - **Wireless Voice Capabilities**

1. Communications Regardless of Technologies, Infrastructures, and Frequency Bands

   Ability for users to transparently communicate, as authorized, among multiple agencies/jurisdictions – some of which may use different technologies, infrastructures and/or frequency bands – regardless of system. Includes the transitioning between commercial systems and private land mobile radio (LMR) systems.

2. Communication with Own Jurisdiction

   Ability to communicate with members of own agency/jurisdiction while using the infrastructure of another agency/jurisdiction.

3. Communication with Other Jurisdictions

Ability to communicate with other agencies/jurisdictions using the infrastructure of that agency/jurisdiction.

4. One-to-One Communications

   Ability for users to transparently communicate, as authorized, with members of other agencies/jurisdictions on a unit-to-unit (one-to-one) basis.

5. One-to-Many Communications

Ability for users to transparently communicate, as authorized, with members of other agencies/jurisdictions on a unit-to-group (one-to-many) basis.

6. Communications Outside Wireless Infrastructure Coverage
   Provide direct communications (talk around) between user radios where wireless infrastructure is unable to support communications (e.g., in some rural areas, underground parking garages, tunnels, and inside some buildings).

7. Jurisdictional Signal Coverage
   Provide jurisdictional-wide signal coverage to system users; optionally, provide ways to enhance or improve jurisdictional coverage into rural areas, underground parking garages, tunnels, and inside buildings that are usually not sufficiently covered.

8. Identification and Authorization
   Ability to initiate wireless voice communications by requiring the user to enter (on his/her radio) a user identification that authenticates and validates the user and loads the user's profile. This profile defines talk groups for the user and completes all radio network administration for the user's voice communications with other members of the user's agency/jurisdiction and with other agencies/jurisdictions, as authorized.

9. Priority Levels for Access and System Use
   Ability of the agency/jurisdiction to administer the priority for voice communications of particular users and particular public safety applications (such as task force operations, incidents, etc.).

10. Emergency Voice Communication
    Ability to communicate an emergency voice message (e.g. after pressing a panic button) that has priority over other voice communications.

11. Emergency Signal
    Ability to broadcast an emergency signal (e.g. via a panic button) that has priority over other communications.

12. Secure Communications
    Ability to have secure (encrypted) voice communications to fit users' environment and which satisfies applicable laws, regulations, policies of the agencies, and jurisdictions of the users.

13. System Administration
    Ability to effectively initiate and sustain flexible and dynamic system administration for purposes of multi-agency interoperability, including administration of talk groups, encryption key management, emergency alerts, networks, and channels for mutual aid.

14. Remotely Re-Program User Radios

    Ability to remotely (over-the-air) re-program a radio's parameters (i.e., frequency channels, talk groups, squelch control, encryption keys, etc.) and/or modify functionality (e.g., encryption algorithms, waveforms, etc.)

15. Resilient Operations

    Ability to sustain resilient operations including tolerance to individual system failures, redundant coverage from adjacent sites, resistance to impact of catastrophic events, etc.

16. Reliable System Performance

    Ability to maintain reliable system performance over disparate interconnected systems.

- **Wireless Data Capabilities**

17. On-scene Wireless Data Networks

    Ability to quickly and transparently establish and maintain on-scene wireless data networks (e.g., on-scene to include in-building).

18. On-scene Exchange of Data

    Ability of on-scene personnel to transparently exchange data.

19. High-Speed Data Transfer

    Capability of high-speed data transfer with ability to sustain performance at network interconnections.

20. Communication with Own Jurisdiction

    Ability to exchange data with members of own agency/jurisdiction while using the infrastructure of another agency/jurisdiction.

21. Communication with Other Jurisdictions

    Ability to exchange data with members of other agencies/jurisdictions using the infrastructure of that agency/jurisdiction.

22. Sensor Networks

    Ability to exchange data involving sensors (e.g., biometric, environmental, personnel location).

23. Identification and Authorization

    Ability to initiate wireless data communications by requiring the user to enter (on his/her terminal/radio) a user identification that authenticates and validates the user and loads the user's profile. This profile defines data resource capabilities for the user and completes all radio network administration for the user's data communications with other members of the user's agency/jurisdiction and with other agencies/jurisdictions, as previously authorized.

24. System Administration
    Flexible and dynamic system administration (includes administration of wireless data networks, adding users, giving permissions).

25. Data Security
    Ability to ensure secure exchange of information.

26. Information Protection
    Ability to protect information according to applicable laws and statutes.

27. Resilient Operations
    Ability to sustain resilient operations including tolerance to individual system failures, redundant coverage from adjacent sites, resistance to impact of catastrophic events, etc.

28. Reliable System Performance
    Ability to maintain reliable system performance over disparate interconnected systems.

- **Information Systems Capabilities**

29. Rapid Information Source Access
    Ability to provide the exchange of information in a timely fashion to support critical decision points from both field and base locations, including but not limited to information regarding identification (photos, fingerprints, etc.) and activity (criminal history, wants/warrants, reporting/contact history, CAD info, building diagrams, building sensors, transportation info, etc.).

30. Query/Access Multiple Data Sources with One Request
    Ability to query/access multiple data sources using one request that is routed to multiple entities simultaneously.

31. "Enter Once – Reuse Forever" Approach to Data Gathering
    Ability to enter validated information once, then share and reuse that information among authorized entities.

32. Data Exchange with Computer-Aided Dispatch
    Ability to exchange information with Computer-Aided Dispatch (CAD) and Record Management Systems (RMS).

33. Data Access to Logistical Resource Information
    Capability to obtain logistical resource information on all personnel and equipment responding to an incident.

34. Emergency Notifications
    Ability to broadcast critical information by means such as text messaging to multiple organizations.

35. Formatting
    Ability to effectively and efficiently exchange data between agencies/jurisdictions (e.g., by employing common data representation structures and exchange formats and protocols).

36. Open Source Formatting
    Ability to effectively and efficiently exchange data between agencies/jurisdictions, e.g., by encouraging open source format.

37. Data Security
    Capability of maintaining the security requirements of any entity within a broader security framework.

38. Field Image Capture and Distribution
    Capability of field image capture and distribution.

39. Data Access to Background Information Sources
    Ability to access information related to hazardous materials, water sources, floor and building plans, fire pre-plans, utility maps, weather forecasts, topographic terrain, transportation, and other background data to support public safety incident management.

40. Data Access to Medical Information
    Ability to manage medical information.

41. Data Access to Legal Information
    Ability to access legal information such as investigation/litigation records, court scheduling records, disposition data, and charge data.

Note: Includes extracts from SAFECOM/AGILE/NIST Summit on Interoperable Communications for Public Safety, held at the National Institute of Standards and Technology (NIST)

Appendix 3 - Evolving Systems Engineering Management Plan Considerations

(an extract from the System of Systems Preliminary Draft Project Plan)

Numerous plans are prepared to define which technical activities will be conducted. They address the integration of engineering specialties requirements, "design-for" requirements, and resource requirements, and discuss how progress toward system level goals will be measured. The Systems Engineering Management Plan (SEMP) is the key planning document which reflects these requirements. The PSRSPC proposes to use the SEMP as its basic plan governing the systems engineering effort for the SoS Project. The SEMP is a concise, top level, technical management plan for the integration of all systems engineering activities. Systems engineering is composed of two components; systems engineering management and the systems engineering process. Both are implemented through the SEMP.

The PSRSPC's SEMP should contain the following elements:

Part I: Technical Program Planning and Control:

Identifies PSRSPC's organizational responsibilities and authority for systems engineering management; PSRSPC's control of subcontracted engineering, verification, configuration management, and technical document and data management; and the proposed plans and schedules for technical design and program reviews. The PSRSPC should propose to cover the following areas in Part I of the SEMP:

- Responsibilities and Authority
- Standards, Procedures, and Training
- Program Risk Analysis
- Engineering Program Integration
- Contract Work Breakdown Structure
- Assessment of Responsibility and Authority
- Program Reviews
- Technical Design Reviews
- Engineering Program Integration
- Technical Performance Measurement
- Change Control Procedures
- Interface Control
- Documentation Control
- Milestones/Schedule
- Plan for other related technical and program management tasks

Part II: System Engineering Process:

Describes the PSRSPC's proposed systems engineering process used in defining the system design and test requirements. In Part II, the PSRSPC should include the specific customization of the process to requirements of the system, procedures to be used in implementing the process, trade study methodology, types of mathematical or simulation models to be used for system and cost effectiveness evaluations, generation of specifications, and generation of applicable engineering documentation. The PSRSPC should cover the following areas in Part II of the SEMP:

- Mission and Requirements Analysis
- Functional Analysis
- Requirements Allocation
- Trade Studies
- Design Optimization
- Design Effectiveness Analysis
- Conceptual Design
- Technical Interface Compatibility
- Logistics Support Analysis
- Producibility Analysis
- Specification Tree/Generation of Specifications
- Documentation
- Other related system engineering tasks

Part III: Engineering Specialty Integration:

Describes the PSRSPC's proposed efforts to integrate the requirements of the engineering specialties into the mainstream system design effort. The PSRSPC SEMP will cover the following areas:

1. Integration Design/Plans Risk Alleviation

    - Reliability
    - Maintainability
    - Human Engineering
    - Producibility
    - Standardization
    - Survivability/Vulnerability
    - Electromagnetic Interference/Compatibility (EMI/EMC)
    - Safety
    - Integrated Logistics Engineering
    - Computer Resources Life Cycle Management Plan
    - Environmental Engineering
    - Related Areas

2. Integration System Test Plans

3. Compatibility with Supporting Activities
    - System Cost Effectiveness
    - Value Engineering
    - TQM/Quality Assurance
    - Materials and Processes

Plans the PSRSPC produces under the SEMP should, as a minimum, contain the following systems engineering information:

1. Plan Objective: Purpose and scope
2. Plan Definition: Succinct description of all tasks required to fulfill the specified purpose including inputs and characteristics of outputs.
3. Responsibilities: Delineation of all organizations collaborating on the tasks, the task(s), or portion of the task for which they are responsible, and the line of authority.
4. Schedule of Activities: Sequence and timing of tasks tied to program schedule milestones, showing inputs from collaborating organizations
5. Resource Definition: Inclusive identification of hardware, software, and facilities required to perform the task(s) within the specified time frame

Providing sufficient detail in the plans can minimize the number of problems likely to be encountered in performing the task(s).

G. Systems Engineering Summary:

Implementation of the foregoing process leads to a well-defined, completely documented, and optimally balanced system. It does not produce the actual system, but rather does generate the complete set of documentation tailored to the needs of the Phase I project, which fully describes the system to be developed and produced. The PSRSPC should be synchronized with the following objectives throughout the life of the SoS Project:

- Participating agency system and subsystem requirements will be consistent, correlatable, and traceable.
- The philosophy of minimum documentation will be evident.
- Acquisition and operating cost will be an integral part of the evaluation and decision process.
- Baselines will be established progressively as an integral part of the systems engineering process.
- The process will result in a design that is complete, at a given level of detail, from a total system viewpoint.
- The process will provide for the timely and appropriate integration of mainstream engineering with engineering specialties to ensure their influence on system design
- The process will be anticipatory, i.e., it will provide for continuing prediction and demonstration of the anticipated or actual achievement of

the primary technical objectives of the system. Problems and risk areas will be identified in a timely manner.

- Formal technical reviews and audits will be an integral part of the systems engineering process.
- The systems engineering process will be responsive to change.
- Significant engineering decisions will be traceable to the systems engineering activities and associated documentation upon which they were based.

Appendix 4 - FCC Licensing Issues Relative to the Use of Gateway Devices

Prepared by Glen Nash, California Department of General Services, Telecommunications Division

BACKGROUND

Section 301 of the Communications Act of 1934 (47 USC Section 301), as amended, requires all devices that transmit energy, communications or signals by radio be operated in accordance with the Act and with a license granted under the provisions of the Act. The Act then goes on to establish the Federal Communications Commission (FCC) as the responsible Federal agency for granting licenses and gives it power to establish rules, processes, and procedures for the issuance of such licenses. The FCC further is empowered to establish rules regarding the use of radio transmitting devices. The power of the FCC is limited to non-government use of the radio spectrum. In this context, the term "non-government" refers to all users other than agencies of the Federal government. Therefore, state/county/local governmental entities are classified as "non-government" and are subject to the rules and regulations promulgated by the FCC.

The Federal Communications Commission has established a large volume of rules regarding use of the radio spectrum by non-governmental users. These rules cover the full gamut from radio and television broadcast, to cellular telephone, to point-to-point microwave and satellite services, to the land mobile radio communications used by public safety agencies. The operation of "gateway devices" would fall within the area of land mobile radio communications. Part 90 of the FCC Rules and Regulations (47 CFR Part 90) establishes the rules governing the use of radio transmitting devices used for land mobile radio communications and establishes the processes and procedures for licensing such devices.

While gateway devices, in and of themselves, generally are not "radio transmitting devices," they are intended to control the use and operation of other devices that are "radio transmitting devices." Therefore, the operation of gateway devices has an impact upon the licensing of those other devices. Furthermore, the restrictions imposed upon the operation of those other devices have an impact on the use of the gateway device by placing restrictions on how it may be used in an operational environment.

Some of the problems related to the use of gateway devices stem from the fact that, when the FCC rules were written/adopted, gateway devices did not exist. Thus, the FCC Rules and Regulations did not contemplate the use of gateway devices and the deployment of such devices poses potential problems. Some of these problems clearly represent violations of the FCC Rules. Others are less clear. It should be noted that a "willful" violation of the FCC Rules and Regulations can lead to a variety of sanctions. These sanctions may vary from a simple order to "don't do it again" to the imposition of fines (called forfeitures in the FCC Rules) of as much as $10,000 per day/per occurrence. In extreme cases, the FCC has made a finding that the individual is "not eligible" to hold

any FCC license, thus would be ineligible to operate any sort of radio transmitting device. While such extreme action is unlikely to ever be taken against a state/county/local governmental entity because of the devastating effect it would have on the provision of public safety services (police, fire, EMS, etc.), the FCC will not accept the continued willful violation of its rules.

POTENTIAL AREAS OF CONCERN

1. In granting a license, the FCC defines the location at which that license is applicable. For example, a station may be authorized for operation at 1234 Main St., Anywhereville, CA. This station may be operated only at that location and cannot be operated at 1236 Main St. (next door) without violating the conditions of the license. While the FCC Rules do not specify the exact level of accuracy required in defining the location of a transmitter, the location is defined on the license in terms of latitude/longitude with an apparent accuracy of $1/10^{th}$ second of arc (which equates to +/- about 10 feet). This level of accuracy is difficult to attain without having a land surveyor conduct a formal survey of the antenna location. In practicality, most licensees adhere to an accuracy of 1 second of arc (about 100 feet).

   Obviously, not all radio transmitters are intended to operate at only one location. Thus, while the stations described above are known as "fixed stations," there are separate classes of stations that are allowed to move about within a defined "operational area." Generally, these stations are called "mobile" stations. These include handheld portable radios and radios installed in some sort of vehicle. It also includes a special class of fixed station known as a "temporary fixed station." In appearance and operation, "temporary fixed stations" are identical to a "fixed station". The difference lies in the fact that the "temporary fixed station" is being used at any particular fixed location for less than 180 days. Typically, the FCC defines the operational area for a mobile or "temporary fixed station" in fairly broad terms (e.g. "Statewide—California" or "Countywide---Los Angeles County, CA" or "30-mile radius around Point A" where Point A is defined in terms of a latitude/longitude").

   The potential problem arising from the use of gateway devices relates to where the device (and its associated radios) is relative to the operational area defined for the associated radios. If the FCC license for a particular radio frequency defines the operational area as "Countywide---Los Angeles County," then that frequency cannot be used in San Bernardino County under that license without violating the conditions of the license. Thus, the operator of a gateway device must be aware of the geographic conditions placed on every license he/she intends to use in activating the gateway device as well as the location at which he/she intends to operate to ensure that he/she is in full compliance with the license requirements.

   The "obvious solution" to this problem is for the State of California to obtain a license on every potential frequency that might be implemented in a gateway

device and to have that license define the operational area as "Statewide---California." Ignoring the potential for a need to operate in an adjoining state, this solution has another significant drawback. Such a license would require that each of the county/local entities on whose "frequency" the device were to be used would have to grant "permission" for the State to have such a license (this "permission" results from a requirement for "frequency coordination" that is intended to minimize interference between different user agencies). Most county/local governmental agencies are reluctant to grant such permission because of the potential interruption to their critical operations if interference were to occur. In fact, the indiscriminate implementation of gateway devices in some parts of California (and at the scene of some incidents) already has resulted in disruptive interference that has negatively impacted normal day-to-day operations. For this reason, operational commanders are very reluctant to grant broad authority to use "their frequencies."

To resolve this potential problem, the agency operating the gateway device must do all of the following:

a. Determine which frequencies upon which the device will be "equipped" to operate. Even though most of today's synthesized radios can be programmed to operate on a wide variety of frequencies, the channels actually programmed into the radios associated with the gateway device (thus available to the operator of the gateway) will have to be limited to those defined in this step.

b. Appropriate FCC licenses authorizing operation of the frequencies defined above will have to be obtained. This might be accomplished by obtaining a letter of authorization for the device to be operated under the FCC license held by some other entity. To the extent that a new FCC license will be acquired, then all of the processes/procedures associated with obtaining that license must be followed. This includes the "frequency coordination" process, in which incumbent users of a given frequency have an opportunity to comment on the proposed "new use." All such comments must be resolved prior to the license application being forwarded to the FCC. Based on past experience, obtaining the necessary concurrences from incumbent licensees can be a daunting task.

c. Guidelines will have to be written which describe what frequencies may be used and the conditions under which those frequencies can be used. These guidelines should include any restrictions limiting the geographic area in which the frequency may be used, the operational conditions under which it might be used, and any requirement for notifying other users prior to use. A process for regular review and updating of the guidelines should be implemented.

d. Operators of the gateway device will have to be educated on the use of the guidelines. Regular training exercises are highly recommended.

e. Use of the guidelines must be strictly enforced. Failure to do so could result in disruptive interference to vital public safety operations during a time of great need.

2. The appropriate manner in which to obtain an FCC license for the radios associated with the gateway device may present a problem. This potential problem relates to the fact that gateway devices did not exist when the FCC Rules and Regulations were written, thus the devices do not clearly fit within one of the standard classifications for transmitting devices. DGS-TD understands that this question has been posed to the FCC, but that no definitive answer has been provided.

   When licensed, radios are "classified" based upon their intended operation. As noted above, some radios might be classified as "mobile radios" while others are classified as "fixed stations." There are specific differences in how some of the other FCC rules are implemented dependent upon how the radio is classified. For example, the frequencies that might be available for licensing are different for different "classes" of fixed station.

   "Mobile" radios generally have the greatest flexibility as to what frequencies are available for licensing and where the radio might be operated. However, "mobile" radios generally are perceived as devices that a person operates. The transmitter is "keyed on" through the use of a "push-to-talk" switch on the radio that is depressed by the operator. The radio is modulated by the operator speaking into a microphone that is integral to the radio. The radios used by gateway devices may have been designed by the manufacturer to be a "mobile" radio, but their functional implementation does not satisfy these traditional definitions. The radio is not "keyed on" by the operation of a "push-to-talk" switch, but rather is automatically "keyed on" by the reception of a signal at the receiver of another radio connected to the gateway device. The radio is not modulated by a person speaking into an integral microphone, but rather is automatically modulated by the signal output from the receiver from another radio connected to the gateway device. Thus, once the gateway device is set-up, there is no requirement that a person operate the associated radios. This mode of operation is more akin to a mode described in the FCC Rules as a "mobile relay" mode of operation.

   Furthermore, gateway devices installed at fixed locations suffer from a more direct classification problem. "Mobile radios" are intended to be just that, mobile. They are expected to be a single location for a matter of minutes, perhaps hours or days, but certainly not months or years. Devices that remain at one location for a long period of time are classified under one of a series of "fixed" classifications, dependent on how the radio is used. These classifications include "mobile relay," "control station," and "base station."

   While "classifying" the radios associated with a gateway device as "mobile relays" may answer one question, it creates new questions and concerns. The

FCC Rules include certain restrictions relative to the frequencies on which a "mobile relay" may operate. Once again, when the FCC Rules were written, "mobile relays" were intended to be radios placed at high locations such that they could "repeat" the signal coming from one subscriber unit out over a wide area such that it could be heard by a large number of subscriber units. In an effort to organize how the overall radio spectrum was utilized, certain frequencies were defined as available for the "inbound" (or "uplink") signal from the originating subscriber unit to the mobile relay and other frequencies were defined as available for the "outbound" (or "downlink") signal from the mobile relay to the "listening" subscriber units. Specific "inbound" frequencies were paired with specific "outbound" frequencies to create what are known as "repeater pairs." The problem with a gateway device is that, typically, it operates by taking the audio associated with the "outbound" channel on one repeater pair and connects it to the "inbound" channel of one or more other repeater pairs. Thus, not only are the radios associated with the gateway device operating in a manner "opposite" to the way a mobile relay typically operates, but it also is not "repeating" on standard repeater pairs.

There is another "class" of fixed station that is intended to operate in a manner similar to that in which the radios associated with the gateway device are intended to operate, i.e. transmitting on the "inbound" channel and receiving on the "outbound" channel of a repeater pair. This class is known as a "control station." However, like the mobile radio, this class of station is intended to interface with a human being and is not described in the FCC Rules as including the "automatic retransmission" feature of the gateway device.

There is no clear solution to this potential problem. Whatever course of action an agency may follow, the FCC may determine at some future date that a different course of action would have been more appropriate. But---failing to obtain a license at all may be perceived as an "intent to commit a willful violation" of the FCC Rules, whereas, obtaining a license that improperly defines the mode of operation would be perceived simply as a "violation" of the FCC Rules. Furthermore, this simple "violation" might be mitigated by an argument similar to that described above, in which it is shown that the Rules were/are unclear and that the State had attempted to act in responsible manner.

Thus, to resolve this problem, DGS-TD recommends that, for whatever frequencies are programmed into the radios associated with the gateway devices, such use be based upon FCC licenses showing "mobile" as the mode of operation. In circumstances wherein the gateway device is installed at a fixed location, then the FCC license should be based upon operation at that fixed location and should show a either a "base station" or a "control station" mode of operation, as appropriate for the frequencies being implemented.

3. The Communications Act of 1934 and the FCC Rules and Regulations contain a general prohibition against willfully causing interference to other licensed users of the radio spectrum. Users of gateway devices need to be cautious with regard

to this requirement. The devices are capable of linking a wide variety of frequencies as a means of enhancing interoperability. But, they also can create monstrous interference problems if not properly used. Potential problems include:

a. Linking together groups of users who have no need or desire to be linked together, thereby causing each group to receive "interference" from the other.

b. Conducting operations on a channel that also is used in a nearby area by some other agency that is not a part of the mutual aid event. This could result in that other entity receiving unacceptable interference to their normal day-to-day operations on that frequency and may render the frequency useless until the interference is resolved.

c. Conducting operations on a channel that is used by one of the participants in the mutual aid event, but is not the channel that they want used for that purpose. As described in "b" above, this could render the affected channel useless for its normal day-to-day purpose. This situation could arise from a failure to keep the operational guidelines up-to-date. For example, when the guidelines were written, the affected agency may have wanted mutual aid operations to occur on that channel. However, they subsequently made changes to their overall radio system and now would want mutual aid operations to occur on a different channel. If the guidelines had not been reviewed and updated to reflect this change, unacceptable interference to the affected agency could result.

d. Based upon the selection of frequencies upon which the radios associated with the gateway device operate and how those radios/antennas are installed, it is possible that inter-modulation products could be created that cause interference problems to other nearby systems. They also could cause the gateway device to go into a "feedback loop."

e. Multiple gateway devices deployed to the same event could interact with each other, thereby causing unacceptable interference.

Appendix 5- PSRSPC Statute as of January 1, 2007

GOVERNMENT CODE
SECTION 8592-8592.7

8592. This article shall be known and may be cited as the Public Safety Communication Act of 2002.

8592.1. For purposes of this article, the following terms have the following meanings:
(a) "Backward compatibility" means that the equipment is able to function with older, existing equipment.
(b) "Committee" means the Public Safety Radio Strategic Planning Committee, which was established in December 1994 in recognition of the need to improve existing public radio systems and to develop interoperability among public safety departments, and between state public safety departments and local or federal entities, and which consists of representatives of the following state entities:
(1) The Office of Emergency Services, who shall serve as chairperson.
(2) The California Highway Patrol.
(3) The Department of Transportation.
(4) The Department of Corrections and Rehabilitation.
(5) The Department of Parks and Recreation.
(6) The Department of Fish and Game.
(7) The Department of Forestry and Fire Protection.
(8) The Department of Justice.
(9) The Department of Water Resources.
(10) The State Department of Health Services.
(11) The Emergency Medical Services Authority.
(12) The Department of General Services.
(13) The Office of Homeland Security.
(14) The Military Department.
(15) Department of Finance.
(c) "First response agencies" means public agencies that, in the early states of an incident, are responsible for, among other things, the protection and preservation of life, property, evidence, and the environment, including, but not limited to, state fire agencies, state and local emergency medical services agencies, local sheriffs' departments, municipal police departments, county and city fire departments, and police and fire protection districts.
(d) "Nonproprietary equipment or systems" means equipment or systems that are able to function with another manufacturer's equipment or system regardless of type or design.
(e) "Open architecture" means a system that can accommodate equipment from various vendors because it is not a proprietary system.
(f) "Public safety radio subscriber" means the ultimate end user. Subscribers include individuals or organizations, including, for example, local police departments, fire departments, and other operators of a public safety radio system. Typical subscriber equipment includes end instruments, including mobile radios, hand-held radios, mobile

repeaters, fixed repeaters, transmitters, or receivers that are interconnected to utilize assigned public safety communications frequencies.

(g) "Public safety spectrum" means the spectrum allocated by the Federal Communications Commission for operation of interoperable and general use radio communication systems for public safety purposes within the state.

8592.2. (a) The committee shall have primary responsibility in state government for both of the following:

(1) Developing and implementing a statewide integrated public safety communication system that facilitates interoperability among state public safety departments listed in subdivision (b) of Section 8592.1 and other first response agencies, as the committee deems appropriate.

(2) Coordinating other shared uses of the public safety spectrum consistent with decisions and regulations of the Federal Communications Commission.

(b) In order to facilitate effective use of the public safety spectrum, the committee shall consult with any regional planning committee or other federal, state, or local entity with responsibility for developing, operating, or monitoring interoperability of the public safety spectrum.

(c) The committee shall meet at least twice a year, of which one meeting shall be a joint meeting with the California Statewide Interoperability Executive Committee to enhance coordination and cooperation at all organizational levels and a cohesive approach to communications interoperability.

8592.3. (a) The committee shall consult with the following organizations and entities:

(1) California State Peace Officers Association.
(2) California Police Chiefs Association.
(3) California State Sheriffs' Association.
(4) California Professional Firefighters.
(5) California Fire Chiefs Association.
(6) California State Association of Counties.
(7) League of California Cities.
(8) California State Firefighters Association.
(9) California Coalition of Law Enforcement Associations.
(10) California Correctional Peace Officers Association.
(11) CDF Firefighters.
(12) California Union of Safety Employees.

(b) Each organization or entity listed in subdivision (a) may designate a representative to work with the committee to develop agreements for interoperability or other shared use of the public safety spectrum between the state public safety departments listed in subdivision (b) of Section 8592.1 and local or federal agencies that operate a communication system on the public safety spectrum and that have capacity and technical ability for interoperability or other shared use.

(c) The committee shall develop a model memorandum of understanding that sets forth general terms for interoperability or other shared uses among jurisdictions, which may be modified as necessary for a particular agreement entered into pursuant to subdivision (b).

(d) A local agency may not be required to adopt the model memorandum of understanding developed pursuant to subdivision (c).

8592.4. (a) The committee shall determine which state public safety departments listed in subdivision (b) of Section 8592.1 need new or upgraded communication equipment and shall establish a program for equipment purchase. In establishing this program, the committee shall recommend the purchase of public safety radio subscriber equipment that will enable state agencies to commence conforming to industry and governmental standards for interoperability as set forth in Section 8592.5. As technology continues to evolve, the committee shall recommend the purchase of nonproprietary equipment or systems that have open architecture and backward compatibility, and that are in compliance with paragraphs (1) and (2) of subdivision (a) of Section 8592.5.

(b) The committee may recommend to any other federal, state, regional, or local entity with responsibility for developing, operating, or monitoring interoperability of the public safety spectrum, the purchase of public safety radio subscriber equipment that will enable first response agencies to commence conforming to industry and governmental standards for interoperability as set forth in paragraphs (1) and (2) of subdivision (a) of Section 8592.5. As technology continues to evolve, the committee may recommend the purchase of nonproprietary equipment or systems that have open architecture and backward compatibility, and that are in compliance with paragraphs (1) and (2) of subdivision (a) of Section 8592.5.

(c) This section may not be construed to mandate that a state or local governmental agency affected thereby is required to compromise its immediate mission or ability to function and carry out its existing responsibilities.

8592.5. (a) Except as provided in subdivision (c), a state department that purchases public safety radio communication equipment shall ensure that the equipment purchased complies with applicable provisions of the following:

(1) The common system standards for digital public safety radio communications commonly referred to as the "Project 25 Standard," as that standard may be amended, revised, or added to in the future jointly by the Associated Public-Safety Communications Officials, Inc., National Association of State Telecommunications Directors, and agencies of the Federal Government, commonly referred to as "APCO/NASTD/FED."

(2) The operational and functional requirements delineated in the Statement of Requirements for Public Safety Wireless Communications and Interoperability developed by the SAFECOM Program under the United States Department of Homeland Security.

(b) Except as provided in subdivision (c), a local first response agency that purchases public safety radio communication equipment, in whole or in part, with state funds or federal funds administered by the state, shall ensure that the equipment purchased complies with paragraphs (1) and (2) of subdivision (a).

(c) Subdivision (a) or (b) shall not apply to either of the following:

(1) Purchases of equipment to operate with existing state or local communications systems where the latest applicable standard will not be compatible, as verified by the Telecommunications Division of the Department of General Services.

(2) Purchases of equipment for existing statewide low-band public safety communications systems.

(d) This section may not be construed to require an affected state governmental agency to compromise its immediate mission or ability to function and carry out its existing responsibilities.

8592.6. (a) The committee shall report to the Legislature by January 1 of each year on the committee's progress in implementing this article.

(b) (1) The annual report shall serve as the state's strategic plan to establish a statewide integrated, interoperable public safety communications network. The report shall include, but not be limited to, implementation strategies and timelines to achieve the goals and objectives set forth in the report. The implementation strategies and timelines may include identification of resource needs, including data formats, possible funding sources, prioritization of expenditures, and the development of common protocols that build upon industry and governmental standards for interoperability as set forth in paragraphs (1) and (2) of subdivision (a) of Section 8592.5 that will advance the integration of local, regional, and statewide interoperable public safety communication networks. The report shall be updated annually, as strategies, timelines, goals, and objectives are accomplished or changed.

(2) In developing the report, the committee, at its discretion, shall consult with any other local, regional, state, or federal entity with responsibility for developing, operating, or monitoring interoperability of the public safety spectrum, and other first response agencies. The report may include recommendations for local, regional, state, or federal entities to coordinate resources and the development of common protocols to advance the integration of local, regional, and statewide interoperable public safety communication networks.

(c) The report will include a complete listing of purchases by state departments of public safety radio communications equipment, for which a waiver of subdivision (a) of Section 8592.5 was granted by the committee.

8592.7. (a) A budget proposal submitted by a state agency for support of a new or modified radio system shall be accompanied by a technical project plan that includes all of the following:

(1) The scope of the project.

(2) Alternatives considered.

(3) Justification for the proposed solution.

(4) A project implementation plan.

(5) A proposed timeline.

(6) Estimated costs by fiscal year.

(b) The committee shall review the plans submitted pursuant to subdivision (a) for consistency with the statewide integrated public safety communication strategic plan included in the annual report required pursuant to Section 8592.6.

(c) The Telecommunications Division of the Department of General Services shall review the plans submitted pursuant to subdivision (a) for consistency with the technical requirements of the statewide integrated public safety communication strategic plan included in the annual report required pursuant to Section 8592.6.

Appendix 6 - Public Safety Radio Strategic Planning Committee resolution regarding compliance with TIA-102/APCO Project 25 standards (September 22, 2006)

BACKGROUND:

California Government Code Section 8592 states the following:

8592. This article shall be known and may be cited as the Public Safety Communication Act of 2002.

8592.1. For purposes of this article, the following terms have the following meanings:
(a) "Public safety spectrum" means the spectrum allocated by the Federal Communications Commission for operation of interoperable and general use radio communication systems for public safety purposes within the state.
(b) "Committee" means the Public Safety Radio Strategic Planning Committee, which was established in December 1994 in recognition of the need to improve existing public radio systems and to develop interoperability among public safety departments, and between state public safety departments and local or federal entities and which consists of representatives of the following state entities:
(1) The California Highway Patrol.
(2) The Department of Transportation.
(3) The Department of Corrections.
(4) The Department of Parks and Recreation.
(5) The Department of Fish and Game.
(6) The Department of Forestry and Fire Protection.
(7) The Department of Justice.
(8) The Department of Water Resources.
(9) The Office of Emergency Services.
(10) The Emergency Medical Services Authority.
(11) The Department of the Youth Authority.
(12) The Department of General Services.
(13) The Office of Homeland Security.

8592.2. (a) The committee shall have primary responsibility in state government for developing and implementing a statewide integrated public safety communication system that facilitates interoperability among state public safety departments listed in subdivision (b) of Section 8592.1 and coordinates other shared uses of the public safety spectrum consistent with decisions and regulations of the Federal Communications Commission. In order to facilitate effective use of the public safety spectrum, the committee shall consult with any regional planning committee or other federal, state, or local entity with responsibility for developing, operating, or monitoring interoperability of the public safety spectrum.

(b) The committee shall elect from among its members a chair with responsibility for leadership in implementing this article.

8592.3. (a) The committee shall consult with the following organizations and entities:
(1) California State Peace Officers Association.
(2) California Police Chiefs Association.
(3) California State Sheriffs' Association.
(4) California Professional Firefighters.
(5) California Fire Chiefs Association.
(6) California State Association of Counties.
(7) League of California Cities.
(8) California State Firefighters Association.
(9) California Coalition of Law Enforcement Associations.
(10) California Correctional Peace Officers Association.
(11) CDF Firefighters.
(12) California Union of Safety Employees.
(13) The Military Department.
(b) Each organization or entity listed in subdivision (a) may designate a representative to work with the committee to develop agreements for interoperability or other shared use of the public safety spectrum between the state public safety departments listed in subdivision (b) of Section 8592.1 and local or federal agencies that operate a communication system on the public safety spectrum and that have capacity and technical ability for interoperability or
other shared use.
(c) The committee shall develop a model memorandum of understanding that sets forth general terms for interoperability or other shared uses among jurisdictions, which may be modified as necessary for a particular agreement entered into pursuant to subdivision (b).
(d) A local agency may not be required to adopt the model memorandum of understanding developed pursuant to subdivision (c).

8592.4. (a) The committee shall determine which state public safety departments listed in subdivision (b) of Section 8592.1 need new or upgraded communication equipment and shall establish a program for equipment purchase. In establishing this program, the committee shall recommend the purchase of equipment that will enable state agencies to commence conforming to accepted industry standards for interoperability specified in subdivision (a) of Section 8592.5.
(b) This section may not be construed to mandate that a state or local governmental agency affected thereby is required to compromise its immediate mission or ability to function and carry out its existing responsibilities.

8592.5. (a) Except as provided in subdivision (b), a state department that purchases public safety radio communication equipment shall ensure that the equipment purchased complies with applicable provisions of the following:
(1) The common system standards for digital public safety radio communications commonly referred to as the "Project 25 Standard," as that standard may be amended, revised, or added to in the future jointly by the Associated Public-Safety

Communications Officials, Inc., National Association of State Telecommunications Directors and agencies of the Federal Government, commonly referred to as "APCO/NASTD/FED."

(2) The operational and functional requirements delineated in the Statement of Requirements for Public Safety Wireless Communications and Interoperability developed by the SAFECOM Program under the United States Department of Homeland Security.

(b) Subdivision (a) shall not apply to either of the following:

(1) Purchases of equipment to operate with existing state or local communications systems where the latest applicable standard will not be compatible, as verified by the Telecommunications Division of the Department of General Services.

(2) Purchases of equipment for existing statewide low-band public safety communications systems.

(c) This section may not be construed to require an affected state governmental agency to compromise its immediate mission or ability to function and carry out its existing responsibilities.

8592.6. (a) The committee shall report to the Legislature by January 1 of each year on the committee's progress in implementing this article.

(b) The report will include a complete listing of purchases by state departments of public safety radio communications equipment, for which a waiver of subdivision (a) of Section 8592.5 was granted by the committee.

8592.7. (a) A budget proposal submitted by a state agency for support of a new or modified radio system shall be accompanied by a technical project plan that includes all of the following:

(1) The scope of the project.

(2) Alternatives considered.

(3) Justification for the proposed solution.

(4) A project implementation plan.

(5) A proposed timeline.

(6) Estimated costs by fiscal year.

(b) The committee shall review the plans submitted pursuant to subdivision (a) for consistency with the statewide integrated public safety communication strategic plan included in the annual report required pursuant to Section 8592.6.

(c) The Telecommunications Division of the Department of General Services shall review the plans submitted pursuant to subdivision (a) for consistency with the technical requirements of the statewide integrated public safety communication strategic plan included in the annual report required pursuant to Section 8592.6.

Government Code Section 14931 gives the Department of General Services (DGS) the authority to purchase public safety equipment for state agencies as follows:

14931. The department may acquire, install, equip, maintain, and operate new or existing communications systems and facilities. To accomplish that purpose, it may, in the name of the state, enter into contracts, obtain licenses, acquire property, install necessary equipment and facilities, and do such other acts as will provide adequate and efficient

communications systems. Any system established shall be available to all public agencies in the state on such terms as may be agreed upon by the agency and the department.

Recent attempts by DGS to purchase equipment that meets the latest "Project 25 standard" as required by section 8592.5 (a)(1) have resulted in non-compliant bids being received from manufacturers. In particular, manufacturers and vendors have been unable to supply equipment compliant with the TIA-102.BAHA "Fixed Station Interface" standard adopted June, 2006. At the time of bid opening and evaluation, no manufacturers who responded were capable of supplying equipment that would comply with this requirement. This was attributed to development and manufacturing lead time associated with tooling up to meet a newly-adopted standard.

The various documents that summarize the Project 25 Statement of Requirements have generally recognized the lag time between adoption of a standard and the availability of products on the market that meet that standard. This resolution allows the Department of General Services the flexibility to adopt new standards into product specifications as market surveys show the ability of manufacturers and vendors to provide compliant products.

RESOLUTION:

Whereas:

- The California Public Safety Radio Strategic Planning Committee is committed to meeting the requirements of California Government Code Section 8592 et. seq., also known as the "Public Safety Communication Act of 2002;"
- The California Public Safety Radio Strategic Planning Committee recognizes that there is a lag time between the adoption of a "Project 25" standard by the Telecommunications Industry Association (TIA) and the availability of compliant products from manufacturers and vendors;
- The Department of General Services (DGS) is tasked by Government Code Section 14931 to procure public safety communications equipment and has the procedures in place to perform market surveys of available equipment that will comply with "Project 25" standards while developing standards for the procurement of that equipment; and
- The California Public Safety Radio Strategic Planning Committee recognizes that some manufacturers and vendors of public safety communications equipment develop products faster than others.

Be it resolved that:

- The California Public Safety Radio Strategic Planning Committee grants the Department of General Services the flexibility to first ensure availability of equipment that complies with “Project 25” standards before incorporating those standards into an equipment purchase specification. The method of determining the availability of such equipment will be the normal market survey process currently conducted by DGS before each Invitation for Bid. Should this survey determine that no manufacturer or vendor will be able to bid a product that complies with this standard, DGS shall have the ability to not include that standard in a procurement specification.
- The California Public Safety Radio Strategic Planning Committee directs the Department of General Services that should they find, during the market survey referenced above, only one manufacturer or vendor capable of supplying a “Project 25” product compliant with the most recently revised or amended standards, DGS shall have the ability to include those requirements into a bid specification and shall recognize that this situation will not result in the bid being characterized a “Non-Competitive Bid.”

Appendix 7 - Detailed "System Of Systems" Project: Planning Phase

Planning required for System(s) for all State Agencies:

Requirements Definition

Develop specific and unambiguous requirements from:

- Informal and formal meetings with applicable agency personnel,
- Evaluation of each agency's operational environment(s), and
- Extensive study of all relevant data

Functional Analysis

Define the agencies baseline of functions and function performance requirements -
(The functional analysis and conceptual design are performed in concert, in order for the conceptual design to be responsive to functional requirements.)

Conceptual Design

Balance the systems engineering process with the functional performance requirements, system constraints, and system effectiveness criteria

Evaluation and Decision

- Summarize and correlates characteristics of alternative solutions to the requirements and constraints which establish the selection criteria
- Document the decision process rationale and risk assessment and risk avoidance considerations

Description of System Elements

Prepare a Design Sheet & Facility Interface Sheet to describe system elements:
1) Design Sheet - Establishes and describes the performance, design, and test requirements for equipment end items, critical components, and computer software programs
2) Facility Interface Sheet - Identifies the environmental requirements and interface design requirements imposed upon facilities by the functional

and design characteristics of equipment end items for configuration management

Documentation

Generate various plans, including the Systems Engineering Management Plan (SEMP) which reflects the requirements:

- Integration of engineering specialties requirements,
- "Design-for" requirements,
- Resource requirements

Part I: Technical Program Planning and Control
Part II: System Engineering Process
Part III: Engineering Specialty Integration:
1. Integration Design/Plans
2. Integration System Test Plans

***SEMP plan Part I - Planning and Controlling defines*:**

- Responsibilities and Authority
- Standards, Procedures, and Training
- Program Risk Analysis
- Engineering Program Integration
- Contract Work Breakdown Structure
- Assessment of Responsibility and Authority
- Program Reviews
- Technical Design Reviews
- Engineering Program Integration
- Technical Performance Measurement
- Change Control Procedures
- Interface Control
- Documentation Control
- Milestones/Schedule
- Plan for other related technical and program management tasks

Part II: System Engineering Process:

Describes the system design (generation of specifications & engineering documentation) and test requirements.

- Mission and Requirements Analysis
- Functional Analysis
- Requirements Allocation
- Trade Studies
- Design Optimization
- Design Effectiveness Analysis
- Conceptual Design

- Technical Interface Compatibility
- Logistics Support Analysis
- Productibility Analysis
- Specification Tree/Generation of Specifications
- Documentation
- Other related system engineering tasks

Part III: Engineering Specialty Integration:
The SEMP plan Engineering Specialty Integration

A) Integration Design/Plans

- Risk Alleviation
- Reliability
- Maintainability
- Human Engineering
- Producible
- Standardization
- Survivability/Vulnerability
- Electromagnetic Interference/Compatibility (EMI/EMC)
- Safety
- Integrated Logistics Engineering
- Computer Resources Life Cycle Management Plan
- Environmental Engineering

B) Integration System Test Plans

Procurement Process:

After DGS' develops a high-level System Specifications:

- Develop Procurement Plan
- Prepare Feasibility Study Report for Department of Finance Review

Prepare System Requirements, and develop Product Specifications prior to entering solicitation phase:

Prepare the following:

- Request For Information & Advertise
  - Review results
- Request For Proposal & Advertise
  - Using the Evaluation and Selection Team Procedures for contract award
- Review Proposals and Interview Candidates
- Prepare Contract and Statement of Work
  - Legal Departments Review Contracts
  - Negotiations

Appendix 8 – Department of General Services "System of Systems" Technical Reviews

DGS TD proposes to conduct the following reviews over the life of the project:

Acquisition Phase	Review	Purpose
Concept Exploration Phase		
Concept Selection	System Requirements Review (SRR)	Evaluate System Functional Requirements; Program Planning
Concept Demonstration & Validation Phase	System Design Review (SDR)	Evaluate System Design; Approve System Specification; Establish Functional Baseline
Program Go Ahead		
Full Scale Development Phase	Software Specification Review (SSR); Preliminary Design Review (PDR) Critical Design Review (CDR) Test Readiness Review (TRR) Formal Qualification Review (FQR) Production Readiness Review (PRR)	Evaluate SW Performance Requirements; Approve SW Development Specs.; Establish SW Allocated Baseline Evaluate Preliminary Design; Approve HW Development Specs; Establish HW Baseline Evaluate Detailed Design; Determine Readiness for HW Fabrication & SW Coding Approve SW Test Procedures; Determine Readiness for CSCI Testing Verify CI's Perform in the System Environment Assess Risk for Production go-ahead

Given the magnitude of this project and degree of equipment elements for all the applicable state agencies, the DGS Review processes will most likely be extensive in nature.